AUDIO VISUAL COMMUNICATION REVIEW

AV

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Lionel C. Barrow, Jr.
Bruce H. Westley — Comparative Teaching Effectiveness of Radio and Television

C. Denis Pegge — The Conception of Simulacrics

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Departments
- Current Developments in Communication
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WINTER 1959

VOL. 7
NO. 1

AUDIO-VISUAL COMMUNICATION REVIEW

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COMMUNICATION REVIEW

VOLUME VII, NUMBER 1 WINTER 1959

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The Audio-Visual COMMUNICATION REVIEW is issued quarterly. Subscription $4.00 per year. $3 of every $8 DAVI membership fee is allocated for subscription to AVCR. Single copy $1.25. Entered as second class matter in Washington, D. C.

Original manuscripts, books for review, and editorial communications should be sent to the Editor: WILLIAM H. ALLEN, System Development Corporation, 2500 Colorado Avenue, Santa Monica, California. (Mark envelope "Personal.")

Subscriptions and business communications should be sent to: MICKEY BLOODWORTH, Managing Editor, Department of Audio-Visual Instruction, National Education Association, 1201 16th Street, N.W., Washington 6, D. C.

STUDENT EVALUATION OF FILMS USED IN COLLEGE SOCIAL STUDIES

● LOUIS W. REDEMSKY

This study reports on university students' evaluation of instructional films used in a basic university social studies course. Louis W. Redemsky is a professor in the Basic College at Michigan State University.

THIS PAPER is concerned primarily with what students believe about the use of audio-visual material and how this material contributes to their growth in knowledge in the social sciences. Where audio-visual aids are used it is important to know what effects they may have upon students' acquisition of knowledge, whether they conclude that certain films are useful or useless in presenting social science subject matter, and their expressions about the techniques used in presenting the film. If they conclude that the use of films enriches the learning experience, one may assume that this leads to a number of favorable direct and residual effects. For example, the rapport between the teacher and the student may be improved, as well as that among the students themselves.

THE STUDY

This study is an evaluation of student attitudes about audio-visual materials used in three sections of the basic social science course at Michigan State University. Students were questioned about their previous experiences with audio-visual aids and were requested to submit free responses about the use of films in the social science course. There were 135 students in the three sections, but absences accounted for the fact that only 126 responded to the questionnaire. Most of the students in the third term social science sections who were subjects of this study were either freshmen or sophomores. The remainder consisted of eleven juniors and

one senior. Seventy-seven members were 16 to 20 years of age; 36 were 21 to 25 years of age; 12 were over 26; and one student did not indicate his age. The group was comprised of 75 males and 51 females.

The subject matter studied for the term was "social control," with major emphasis on the definitional view of social control, informal agencies of social control, American government as social control, British and Soviet government as a means of control, the nature of totalitarianism, and international relations. The students used a departmentally prepared book of readings and a syllabus as their primary sources of study.

Ordinarily, without the use of films, lectures and occasional discussions are the instructional methods used in most classes. Instructional methodology used in this study was the lecture and discussion plus a scheduled series of films to supplement these lectures and discussions. The films were selected on the basis of their relevance to the specific areas of social control being studied. For some areas it was impossible to use films, because suitable ones were not available. A prearranged time schedule was followed, because it was possible to rent films from the Michigan State University Audio-Visual Center. According to this schedule, in most instances the films were presented on the same day of the week—Monday.

THE METHOD

A specific technique was used in introducing the subject matter of the films, viz.; a discussion of the content of the film and its relation to the subject matter of the course was presented prior to showing the film. In addition, discussion of the content of the film with the students the day following the viewing was routine procedure. In each case a definite effort was made to show in what way the film correlated with the subject matter in the readings and the lecture.

The responses to a questionnaire were recorded on IBM cards to facilitate the tabulation of the responses. The data which follow are an analysis of the questionnaire.

THE SAMPLE

As previously stated, most of the students were 16-20 years of age (61 percent). Responses to the questionnaire from older

students may reveal a different reaction to the films than the responses from younger students. About 29 percent of the students were in the 21-25 age bracket and about 10 percent in the 26 and over age bracket. Academically, most of the students had acquired sophomore standing, inasmuch as 78.8 percent of the subjects in the study were members of the class. Of the respondents 59.5 percent were male and 40.5 percent were female. This ratio does not agree with the ratio of males to females attending the University. The University ratio is approximately three males to one female.

Some students had had previous opportunities for viewing films as a supplement to other classroom experiences, 54 percent having had some experience, 34.1 percent very little experience, and 4.8 percent no experience. Only 6.3 percent seem to have had numerous opportunities for viewing films as part of the classroom experience.

The fact that students have had some previous experience in viewing films in other classes should make it possible for them to use the former experience as criteria for evaluating the experience they had in this study. One cannot be sure that a comparison of the divergent situations was made by students, but there is the possibility that their previous experience may have influenced their reactions to the methods and techniques used in this experiment.

THE RESULTS

Value of Discussion

In order to make the use of films a learning experience, most educators assume that discussion of the film before and after the showing should be routine procedure in the use of audio-visual materials. Table 1 reveals that students who had had previous experience with the use of films indicated that discussion was negligible. Only 16.7 percent indicated that discussion was always a part of the classroom procedure. In view of this revelation it would be extremely difficult for students to assess the importance of the subject matter of a film if no explanation is given for the use of the film.

It is questionable whether the use of films without some discussion provides maximum educational value. Inasmuch as a regular pattern of discussion was established in this experiment, students, again, may be comparing their past experience with the

TABLE 1.—PREVIOUS DISCUSSION OF FILMS

Frequency of Discussion	*Number*	*%*
Always	21	16.7
Sometimes	47	37.3
Very little	45	35.7
Never	13	10.3

experience they had in this experiment. Student reaction to discussion of films in this experiment will be reported later.

Relative to the beliefs of the students about the discussion of films, 98.4 percent of the respondents felt that discussion definitely aids learning, and one failed to respond to the question. Obviously the reaction of the student is purely subjective, and no objective evidence from this study is available to establish the fact that learning has occurred from the discussion of films. On the other hand, the purpose of this study was an attempt to measure student beliefs about audio-visual aids and their attitudes toward specific procedures in the use of such aids.

Value of the Films to the Students

Table 2 is a compilation of student responses regarding the helpfulness of films shown for the term in this experiment.

TABLE 2.—EXTENT OF HELPFULNESS OF THE FILMS USED IN THE EXPERIMENT

Extent of Helpfulness	*Number*	*%*
Very helpful	72	57.1
Moderately helpful	51	40.5
Of no help	0	0
No response	3	2.4

Apparently, students considered the films relevant to the subject matter of the course, or otherwise they would have expressed contrary views to that effect. A negative expression about the films used, from a large segment of the population studied, should definitely result in a critical analysis of the films and the accompanying techniques used in their introduction.

The subjects of this study were asked whether they thought they recalled some of the ideas developed in the films when they

wrote examinations. It appears that a large number did think that some recollection of ideas was present. Table 3 shows these responses.

TABLE 3.—RECOLLECTION OF FILM IDEAS WHEN WRITING EXAMINATIONS

Recollection of Films	*Number*	*%*
Often	50	39.7
Sometimes	64	50.8
Not sure	10	7.9
Never	2	1.6

Note-Taking During Film Showings

One of the problems involved in using films as part of the classroom procedure is the incompleteness of student note-taking while viewing the film, or after they have viewed the film. The classroom used for film projecting was illuminated enough to permit students to take notes while the films were being shown. Table 4 compares the note-taking behavior of the students in conventional classroom instruction and during the films shown.

TABLE 4.—NOTE-TAKING BEHAVIOR

	Notes Taken in Class		*Notes Taken on Films Shown*	
Frequency	*Number*	*%*	*Number*	*%*
Always	98	77.8	15	11.9
Sometimes	24	19.0	63	50.0
Never	4	3.2	48	38.1

It would appear that a more concentrated effort should be made to direct the student's attention to the advantages and the necessity of taking notes on films. Perhaps the infrequent use of films as part of regular classroom procedure in most classes may be a factor contributing to the students' disregard of note-taking when the films are shown. Further study concerning note-taking about films may reveal some of the reasons students do not take notes. Perhaps, if more films were used and examinations constructed which included some of the concepts developed in the

films, students could be motivated to regard films equally as valuable as lectures and discussions. In this experiment it was mentioned to the students that taking notes would prove helpful in reviewing some of the concepts included in the films, inasmuch as a few questions relative to the films would appear on the examination. Additional measures to enforce regular note-taking were not utilized by the instructor. It appears that note-taking on audio-visual material is one of the major problems confronting the instructor who desires to make extensive use of films as a supplementary instructional technique.

Discussion of Films

It was not always possible to schedule films before a particular segment of the course was presented in a lecture or discussed in class. Consequently, some films were shown before, and some after, related material had been presented in a lecture or discussion. It appears that student opinion was about equally divided on the question, "When do you think the showing of films would be most effective?"—50.8 percent of the students thinking that films can be used most effectively after discussion of related material and 47.6 percent that films can be used to better advantage before related material is discussed. The data make it difficult to assume that a specific sequence of presentation of films is best. According to the opinion of the subjects of this study, showings could be made either before or after related subject matter has been discussed without seriously changing the effectiveness of the film shown.

Best Time To Show Films

One of the inquiries submitted to students concerned the matter of a time schedule for showing films. Inasmuch as Monday was the day of the week when most films were shown, the purpose of the question was an attempt to find out whether students considered this to be the best day. Most of the students (59.5 percent) thought that Monday was satisfactory, although 15.9 percent showed a preference for Thursday and 17.5 percent for Friday. No doubt, the fact that most of the films were shown on Monday did influence student decision, and this did permit discussion of films in succeeding class meetings if they consumed the full hour on Monday.

Student Evaluation of Usefulness of Films

Students were asked to give free responses in which they were to indicate which films had been useful to them. Almost every student wrote a statement or two about the usefulness of the films. Only 4.8 percent of the total number of students did not respond to the request. Eight rather broad categories were constructed under which most of the free responses of the students were recorded. The statements which could not be included in one of the eight categories were listed under the classification of "Others." Table 5 shows the eight categories established and the number of responses for each.

One may assume from the data of Table 5 that the students have a favorable attitude toward films and seem to feel that they are very useful as a supplement to the regular classroom procedure.

TABLE 5.—WAYS IN WHICH THE FILMS HAVE BEEN USEFUL

Types of Responses	*Number*	*%*
Clarified previous misconceptions about the subject	2	1.6
Helped mental visualization of lectures and readings	40	31.6
Created a better understanding of the course	22	17.5
Clarified points not too easily understood when reading text	19	15.1
Learned better through the medium of audio-visual aids, lectures and discussion	19	15.1
Added variety	6	4.8
Promoted understanding of some topics which would be difficult to discuss in class	2	1.6
Were well coordinated with the course	2	1.6
No response	6	4.8
Others	8	6.3

The respondents were also requested to give in their own words helpful suggestions for the use of films. Many did not respond to the request. Table 6, a summary of the responses, reveals that 43.6 percent of the students made no suggestions. The suggestions which were given were distributed in seven categories, of which the category referring to discussion of the films and pointing out important points during the film included 17.4 percent of the suggestions.

TABLE 6.—SUGGESTIONS FOR THE USE OF FILMS

Types of Suggestions	*Number*	*%*
One film a week related to subject matter	3	2.4
Show more films the day after discussing the material	4	3.2
More discussion before and after films, plus pointing out important points during the film	22	17.4
Films should be critically screened. Some were good, but others were not useful	6	4.8
Use more films	17	13.5
More up-to-date films	5	4.0
No response	55	43.6
Others	14	11.1

A tabular cross reference was constructed of the suggestions students made for the use of films, and responses they made relative to other inquiries on the questionnaire. Table 7 is a cross reference to the students' suggestions for the use of films and the question which asked the respondent how much experience he had had in classroom discussion of films.

TABLE 7.—SUGGESTIONS FOR USE OF FILMS ACCORDING TO PREVIOUS DISCUSSION OF FILMS

	Previous Discussion							
Suggestions	*Always (21)*		*Sometimes (47)*		*Very little (45)*		*Never (13)*	
One per week			2	4.3	1	2.2		
Film after discuss. mat.	1	4.8			3	6.7		
More discussion	2	9.5	8	17.0	8	17.8	4	30.8
Critical screening	3	14.3	1	2.1	2	4.4		
More films	4	19.0	5	10.6	6	13.3	2	15.4
Up-to-date films			2	4.3	2	4.4	1	7.7
No response	9	42.9	24	51.1	18	40.0	4	30.8
Others	2	9.5	5	10.6	5	11.1	2	15.4

An analysis was made of the suggestions students made for the use of films according to the academic status of the subjects involved in the study. Table 8 shows that the sophomores and juniors indicated that more discussion of the films was necessary. None of the freshmen suggested more discussion. On the other hand, the freshmen were in favor of using more films.

A few comparisons were also made between students' statements about the usefulness of films and previous assertions students made relative to other inquiries on the questionnaire. A comparison was made between students' estimated grades and statements of how the films were useful to them. Eighty-eight and nine-tenths percent of the students who estimated their grade to be "A" said that the films materially helped them to mentally visualize lectures and readings, and 11.1 percent who estimated their grade to be "A" also said they learned better through the medium of audio-visual aids, lectures, and discussions. There may not be any greater significance in what the "A" student believes to be important than the "D" student; inasmuch as a study of attitudes

TABLE 8.—SUGGESTIONS FOR USE OF FILMS ACCORDING TO ACADEMIC STATUS

	Academic Status							
	Freshman		*Sophomore*		*Junior*		*Senior*	
Suggestions	*(16)*		*(98)*		*(11)*		*(1)*	
One per week			2	2.0	1	9.1		
Film after discuss. mat.	3	18.8	1	1.0				
More discussion			18	18.4	4	36.4		
Critical screening			6	6.1				
More films	5	31.3	10	10.2	2	18.2		
Up-to-date films	1	6.3	4	4.1				
No response	7	43.8	45	45.9	3	27.3		
Others			12	12.2	1	9.1	1	100.0

cannot overlook either the "A" student or the student with a lower grade average. Therefore, the 60.0 percent of the "D" students who also said they mentally visualized lectures and readings is worthy of consideration.

The comparison of students' estimated grades with their expressions affirming the usefulness of films shows no marked difference in the attitudes of the poorest and the best students.

A similar analysis according to the age of the student showed that those 20 and older gave somewhat similar responses to the lower-age groups.

To find out whether older respondents made suggestions for the use of films different from those of the younger respondents,

TABLE 9.—SUGGESTIONS FOR USE OF FILMS ACCORDING TO AGE

Suggestions	*Age*							
	16-20 (77)		*21-25 (36)*		*26 & over (12)*		*No response (1)*	
One per week	3	3.9						
Film after discuss. mat.	2	2.6	2	5.6				
More discussion	14	18.2	6	16.7	1	8.3	1	100.0
Critical screening	1	1.3	3	8.3	2	16.7		
More films	9	11.7	5	13.9	3	25.0		
Up-to-date films	3	3.9	2	5.6				
No response	37	48.1	12	33.3	6	50.0		
Others	8	10.4	6	16.7				

an analysis was made to compare the suggestions according to the various age groups. These results are shown in Table 9.

The older students appeared to favor the use of more films and their critical screening, whereas the younger students favored more discussion.

CONCLUSION

The purpose of this study was to determine what attitudes students have about films if a specific procedure is used in presenting them, what previous experience they had in viewing films, what previous experience they had in discussing films, what they thought about the value of discussing films, what they thought about the usefulness of films in this study, what they recollected about films when writing an examination, what day of the week they considered best for showing films, what suggestions they offered for improving the use of films, and to what extent they took notes when films were shown.

1. The responses of the students indicated a very favorable attitude existed about the films used and the technique in presenting them.

2. About half of the respondents had had some previous experience in viewing films as part of the classroom experience, but many of them said discussion of films occurred very little or not at all.

3. Students valued discussion very highly.

4. A large number of students considered the films used in this study very helpful in visualizing the lectures and readings, understanding the course, and clarifying points not too easily understood when they read the textbook.

5. It seems students do not recognize the importance of taking notes during the showing of a film.

6. The respondents were divided in their opinions about showing films before or after related material had been presented by lecture or discussion. Over 50 percent also indicated Monday as the best day of the week to show films.

7. They suggested that more discussion before and after the film showing, pointing out important points to look for, would be helpful.

8. A tabular cross reference showed that sophomores and juniors suggested more discussion of films than freshmen, and a larger percent of freshmen suggested more films be used. A comparison of students' estimated grades with their expressions about the usefulness of films shows no marked difference in the attitudes of the poorest and the best students. A large number of students who considered the films helpful also said they recollected films when writing examinations. A larger percentage of the older students, when compared with the younger students, suggested more films be used and films be critically screened. A comparison of students' statements about the way in which films were useful with students' academic status showed very little difference between the academic groups.

COMPARATIVE TEACHING EFFECTIVENESS OF RADIO AND TELEVISION

- LIONEL C. BARROW, JR.
- BRUCE H. WESTLEY

This report presents the principal findings of a study conducted for the University of Wisconsin Television Laboratory, of which Raymond J. Stanley is director, and the Wisconsin School of the Air, with the assistance of a grant-in-aid from the Educational Television and Radio Center, Ann Arbor, Michigan. Lionel C. Barrow is a graduate student in mass communications and a study director in the Television Laboratory. Bruce H. Westley, an associate professor in the School of Journalism, is research coordinator of the Television Laboratory. The authors gratefully acknowledge the cooperation of the Madison public schools, of which Philip H. Falk is superintendent; the patient collaboration of Professor Arlene McKellar, associate director of the School of the Air; and the technical assistance of script-writer Ruth L. Plakias, narrator Roy Vogelman, actor Ken Ohst, and director Gary Nathanson of the staff of WHA and WHA-TV.

PRIOR RESEARCH has given some indication that a medium which utilizes both visual and auditory dimensions, such as television or sound motion pictures, is more effective in transmitting information than one which utilizes the auditory dimension alone, such as radio.

For example, Nelson (4) let one group view two sound films while a second group heard the sound track of the same films. His audio-only group averaged 33.6 points on a 65-point multiple-choice test administered immediately after exposure, by comparison with an average of 44.9 points for the group which saw the audio-visual version. Nelson, Moll, and Jaspen (5) repeated the study with modifications and obtained similar results. Nelson and VanderMeer (6) also found that a sound film was superior to sound track alone in transmitting factual information.

Three experimenters who used television as the audio-visual medium published similar findings. Williams (10) found television superior to radio in transmitting factual information, using a paper-and-pencil aided-recall test administered immediately. In a unique use of television—to transmit weather information to pilots —Frank (1) also found a television version superior to an audio-only version.

While these studies are interesting in terms of the relative contribution of the audio and video elements to the effectiveness of television and sound motion pictures, they cannot, with the possible exception of the Williams study, be regarded as adequate *media* comparisons. They are obviously not generalizable, for example, to sound versus silent films or to radio versus television.

PROCEDURE OF THE EXPERIMENT

There are at least four ways in which such a comparison may be made. As was done in the first three studies cited above, we may produce an audio-visual program and pipe the sound track to a "radio" audience. This obviously handicaps radio. Or we may produce a radio program and add the video by pointing TV cameras at the speakers. Obviously this handicaps television. A third alternative is to produce a "simulcast." This method would take the limitations of both media into account but would not maximize their unique advantages.

The fourth possibility is to *produce the programs separately with instructions to the technical personnel to do everything possible to maximize the effectiveness of both media.* This procedure permits the use of the full potentialities of both media within the limits of the available technical and professional resources. It, too, has its drawbacks. It may lead to a high degree of uncontrolled variation, thereby confounding results. Despite this hazard, however, such was the procedure chosen for this experiment. The authors preferred the possibility of an ambiguous result to the probability of creating an unfair advantage for one medium or the other. The outcome appears to justify this choice.

To minimize possible confounding effects, the same script-writer prepared both versions,[1] the same actors played the same roles in both versions, both programs were broadcast at the same time—9:30 a.m. on four successive Thursdays—and the script-writer was instructed to use the same factual information in both

[1] In three out of four instances the television program was written from the radio program.

programs. Although the total wordage was not the same, since a minute of radio time characteristically presents more words than a minute of TV time, there was an extremely high correlation between the two sets of scripts in *relative emphasis*, as data below demonstrate.

The Subjects

All pupils in eight classrooms in four Madison, Wisconsin, public schools took part in the experiment—228 in all. Some attrition occurred but it was negligible and did not affect the analysis. Mean total IQ for the 228 pupils on the California Test of Mental Maturity was 111.93. The radio group mean was 112.19; the TV group mean was 111.67. The distribution was approximately normal.

The Variables

The major *independent variables* were:

1. Medium (radio versus television)
2. Programs
3. Discussion before versus discussion after testing
4. Thematic emphasis
5. Visual presentation.

The discussion variable involved following the program with a 7½-minute teacher-led class discussion of the material in the broadcast, a manipulation which sometimes followed and sometimes preceded the tests described below.

Thematic emphasis was defined as the number of words devoted to a theme in the radio or TV script. Over and above the media difference, the visual presentation variable took note of what themes in the television version were accompanied by supporting visuals, such as film clips, stills, and maps.

The major *mediating variables* were:

1. Intelligence
2. Media use
3. Knowledge of news personalities.

The major *dependent variables* were:

1. Immediate recall of factual information
2. Delayed recall of factual information
3. Saliency of themes.

Immediate recall of factual information was measured by means of a 24-item multiple-choice test of information contained in each of the four programs. It was administered by the teacher during the 15-minute period following reception of the programs (whenever the design called for these data; see design section below).

Delayed recall was measured six weeks after the last broadcast in the series by means of a 32-item test consisting of the eight items from each of the immediate recall tests which proved by item analysis to be the "best discriminators."

Saliency was measured by a two-part open-end questionnaire. The first part was regarded as a warm-up and was not analyzed. It asked the subject to tell "What parts of today's program were most interesting to you?" The second part was worded as follows: "Now write down everything you can remember from today's program. Try to remember as much detail as you can." Saliency of themes was determined by noting for each subject what theme was mentioned *first.*

The Programs

"Exploring the News" is a background-of-the-news program designed for use in sixth grades to supplement instruction in current events. It was originally produced for radio by WHA and the School of the Air and had been broadcast more or less regularly for several years. During the fall of 1957 a television version of the program was developed. It is broadcast weekly during school hours.

The program is always based on some recent and significant news event or events. It does not cover the week's news; rather it isolates one or two major developments for extensive treatment, emphasizing such things as the historical backgrounds and social institutions of countries in the news, political precedents, long-range economic trends, et cetera.

The four programs in the experimental series, which were broadcast during January 1958, concerned (a) the presidency and the presidential succession, (b) the 85th Congress and the issues before it, (c) the Fuchs expedition to the South Pole and living conditions there, and (d) the new United States of the Caribbean and the revolt in Venezuela.

The script-writer was given an entirely free hand in developing the programs except for the instructions mentioned above. The

timely nature of the subjects made it impossible to prepare the scripts more than three days in advance. This prevented any pretesting of the information tests. These conditions also meant that the program variables had to be "coded out" rather than "built in." Such *post-hoc* analysis limits the certainty of the findings.

The themes in all programs were categorized by *thematic emphasis,* defined as the number of words in the commentary used to describe a theme, and by *method of presentation: visual* if in the TV versions the presentation of the theme was supplemented by visuals, and *nonvisual* if in the TV versions the theme was presented without visuals. The occurrence of the same themes in the radio version was used as a control.

As expected, more words were used in the radio versions of the four programs than in the TV versions (8315 to 7540). Relative emphasis of the themes, however, was remarkably close. Rank order correlations (3) for the themes in each of the four programs were as follows:

	Rho	*N Themes*
Presidency	.72	10
Congress	.92	8
South Pole	.83	21
Latin America	.86	10

Visual themes received 52 percent of the emphasis in the TV versions. The same themes received 51 percent of the emphasis in the radio versions.

EXPERIMENTAL DESIGN

Pupils in each of the eight classrooms were randomly assigned to radio or television treatment groups after double stratification for verbal and nonverbal intelligence as measured by part-scores on the California MM.[2] Except for absentees all subjects saw or heard all four programs. However, all subjects did not receive the same "after-program" treatment. The reason was that the school system imposed a 30-minute limit on the entire activity, 15 minutes of which were occupied by the program itself. In order to permit valid comparisons, to control all other variables while varying one at a time, and to control for order effects, the randomly-assigned, rotating-treatment design shown in Table 1 was developed.

[2] Intelligence data used in the stratification were based on tests administered in the third grade. Shortly after this experiment all sixth-graders were re-examined. The more recent data were used in the analysis.

TABLE 1.–EXPERIMENTAL DESIGN

School	Class	Programs 1	2	3	4
I	1	S D	R_1 S	R_3 D	R_2 S
		A	D	C	B
	2	D S	S R_1	D R_3	S R_2
II	3	R_1 S	S D	R_2 S	R_4 D
		B	A	D	C
	4	S R_1	D S	S R_2	D R_4
III	5	R_1 D	R_1 S	S D	R_3 S
		C	B	A	D
	6	D R_1	S R_1	D S	S R_3
IV	7	R_1 S	R_2 D	R_1 S	S D
		D	C	B	A
	8	S R_1	D R_2	S R_1	D S

S=Saliency questionnaire
D=Discussion period
R=Recall test (subscript indicates program tested: R_1=Program 1, etc.)

The capital letters designate basic after-program treatment combinations which are uniform except for whether the recall test is based on the immediate program or a previous one. Thus each treatment combination was rotated through programs and schools after a random start. Approximately 7½ minutes was assigned to each treatment.

RESULTS

Saliency

Following each program six of the eight classroom groups received the open-end questionnaire. Their responses were subsequently analyzed for saliency—for what "came to the top" first. Both method of presentation and emphasis proved to be significantly related to saliency.

Visual themes received 67.2 percent of the first mentions in the TV group. The same themes received 59.3 percent of the first mentions in the radio group. (See Table 2.) A critical ratio between the two percentages revealed that the TV visual percentage was significantly greater than its radio counterpart. This suggests that while the visual element is making a difference, something else is also making a significant contribution.

TABLE 2.—THE NUMBER (N) AND PROPORTION (P) OF PUPILS WHO MENTIONED FIRST A THEME WHICH IN THE TV VERSION HAD OR DID NOT HAVE SOME ADDITIONAL VISUAL ELEMENTS SUCH AS FILM CLIPS, MAPS, ETC.

	Radio Group			*TV Group*		
Programs	*Visual*	*Non-Vis*	*T*	*Visual*	*Non-Vis*	*T*
	N (P)	N (P)		N (P)	N (P)	
Presidency	41 (.55)	33 (.45)	74	50 (.64)	28 (.36)	78
Congress	37 (.52)	34 (.48)	71	40 (.55)	33 (.45)	73
South Pole	49 (.63)	29 (.37)	78	61 (.74)	21 (.26)	82
Latin America	52 (.66)	27 (.34)	79	58 (.74)	20 (.26)	78
TOTAL	179 (.59)	123 (.41)	302	209 (.67)	102 (.32)	311

Binominal tests (8) for the significance of differences yield a z score of 3.165 for the radio group and 6.010 for the TV group, both of which are significant at the .001 level. A critical ratio between the number who chose visual themes in the TV group and those who chose the same themes in the radio group yields a CR=2.03, which is significant at the .05 level.

A clue as to what that "something else" is comes from examining the relation of emphasis to saliency. For the purposes of this analysis, the themes were rank-ordered and then split into two categories—high and low emphasis. The high emphasis themes received 56.1 percent of the first mentions in the radio group and 56.4 percent in the TV group. The differences between first mentions for high and low emphasis themes were significant at the .05 level in both cases. (See Table 3.)

TABLE 3.—THE NUMBER (N) AND PROPORTION (P) OF PUPILS WHO MENTIONED FIRST A THEME WHICH HAD HIGH OR LOW EMPHASIS IN THE PROGRAMS

	Radio Group			*TV Group*		
Programs	*High*	*Low*	*T*	*High*	*Low*	*T*
	N (P)	N (P)		N (P)	N (P)	
Presidency	24 (.32)	50 (.68)	74	47 (.60)	31 (.40)	78
Congress	34 (.48)	37 (.52)	71	39 (.53)	34 (.47)	73
South Pole*	49.5 (.63)	28.5 (.37)	78	47.5 (.58)	34.5 (.42)	82
Latin America	62 (.78)	17 (.22)	79	42 (.54)	36 (.46)	78
TOTAL	169.5 (.56)	132.5 (.44)	302	175.5 (.56)	135.5 (.43)	311

Binominal tests for the significance of differences yield a z score of 2.072 for the radio group and 2.155 for the TV group, both of which are significant at the .05 level.

* This program was coded into an odd number of themes. Therefore scores for the median theme were equally divided between the high and low emphasis groups.

Immediate Recall

Three of the four main variables—medium, IQ, programs[3]—produced significant differences. Only the differences between the discussion groups failed to reach significance. None of the interaction terms were significant. The means, cell sizes, and significance levels for the main effects are shown in Table 4.

The superiority of TV over radio was consistent for all IQ groups and for all programs.

TABLE 4.—MEANS, CELL SIZES, AND SIGNIFICANCE LEVELS OF MAIN EFFECTS FOR 24-ITEM IMMEDIATE RECALL TESTS

Variable Subgroup	*Mean*	*Cell Size*	**F Significant at*
Medium			.01
Radio	15.27	111	
TV	16.48	110	
Total IQ			.001
High (above 116)	17.81	76	
Medium (107-116)	15.91	70	
Low (below 107)	14.18	75	
Programs			.01
Presidency	14.65	62	
Congress	17.13	55	
South Pole	15.08	51	
Latin America	17.15	53	
Discussion			n.s.
Yes	15.76	109	
No	16.16	112	
TOTAL	15.96	221	.....

* Obtained from an analysis of variance of the C "after-program" treatment (see Table 1) with appropriate corrections for disproportionality as suggested by Snedecor (9).

Delayed Recall

The delayed recall test based on all four programs was administered in the sixth week after the fourth program. An analysis of variance revealed that while the IQ and school differences were still significant, radio versus TV was not. Again none of the interaction terms reached significance. (See Table 5.)

[3] The program variable is confounded. Because the design prevented assigning the immediate recall test to all subjects on all programs, scores for the programs are from subjects in different schools. The data are from the C blocks (see Table 1).

TABLE 5.—MEANS, CELL SIZES, AND SIGNIFICANCE LEVELS OF MAIN EFFECTS FOR 32-ITEM DELAYED RECALL TEST

Variable Subgroup	*Means*	*Cell Size*	**F Significant at*
Medium			n.s.
Radio	19.41	97	
TV	20.02	96	
Total IQ			.001
High (above 116)	22.13	71	
Medium (107-116)	19.78	63	
Low (below 107)	16.75	59	
Schools			.01
1	19.07	42	
2	19.16	50	
3	18.49	51	
4	22.06	50	
TOTAL	19.72	193	.....

* Obtained from an analysis of variance with appropriate corrections for disproportionality suggested by Snedecor (9).

An analysis of the program-by-program subscores showed small but consistent mean differences in favor of the TV group:

	Radio	*TV*
Presidency	5.01	5.14
Congress	4.69	4.85
South Pole	5.44	5.68
Latin America	4.27	4.31

SUMMARY

This experiment was designed to compare the relative effectiveness of equivalent radio and television versions of a series of background-of-the-news programs for grade school children. Some 228 sixth-graders took part in the experiment. Classroom groups were randomly divided and assigned to the radio or TV treatment.

The TV group made significantly higher scores than the radio group on an immediate recall test of factual knowledge. The TV group's score on a delayed recall test six weeks after the last program still was higher than the radio group but the difference was no longer significant. (IQ was significantly related to scores on both the immediate and the delayed recall tests.)

A teacher-led discussion after the program but before the administration of the immediate recall test did not produce higher scores than absence of discussion before the test. Thematic emphasis (defined as the number of words used to describe a theme) and method of presentation (defined in terms of the use or nonuse in the TV versions of such visual aids as film clips and maps) were both significantly related to saliency (defined as frequency of first mentions in response to an open-end question).

REFERENCES

1. FRANK, J. H. *An Evaluation of Closed Circuit Television for Interceptor Pilot Training.* Unpublished doctoral dissertation. Bloomington: Indiana University, 1955. Abstract: *Dissertation Abstracts* 15:2060-61; 1955.

2. HOBAN, CHARLES F., JR., and VAN ORMER, EDWARD B. *Instructional Film Research, 1918-1950.* SDC Human Engineering Project 20-E-4. Port Washington, N. Y.: Special Devices Center, 1951.

3. MCNEMAR, QUINN. *Psychological Statistics.* New York: John Wiley and Sons, 1949.

4. NELSON, H. E. *The Relative Contributions to Learning of Video and Audio Elements in Films.* Progress Report No. 13, Instructional Film Research Program. State College, Pa.: Pennsylvania State College, 1949.

5. NELSON, H. E.; MOLL, K. R.; and JASPEN, W. *Comparison of the Audio and Video Element of Instructional Films.* Technical Report SDC 269-7-18. Port Washington, N. Y.: Special Devices Center, 1950.

6. NELSON, H. E., and VANDERMEER, A. W. *The Relative Effectiveness of Differing Commentaries in an Animated Film on Elementary Meteorology.* Technical Report SDC 269-7-43. Port Washington, N. Y.: Special Devices Center, 1955.

7. PAUL, J., and OGILVIE, J. C. "Mass Media and Retention." *Explorations* 4:120-23; 1955.

8. SIEGEL, SIDNEY. *Nonparametric Statistics.* New York: McGraw-Hill Book Co., 1956.

9. SNEDECOR, GEORGE W. *Statistical Methods.* Ames: Iowa State College Press, 1950.

10. WILLIAMS, D. C. "Mass Media and Learning—An Experiment." *Explorations* 3:75-82; 1954.

THE CONCEPTION OF SIMULACRICS

• C. DENIS PEGGE

In this paper, the author presents a concept he calls "simulacrics" and suggests its development into a future science of lifelike representation in motion picture films. *C. Denis Pegge formerly taught in the engineering department of Cambridge University, having organized its Educational Film Council. He is now engaged in writing.*

BY "SIMULACRICS" I imply a possible future field of study and science of lifelike representation. This kind of representation is to be associated primarily with the film, and—through their close relations to the film—with sound and sight broadcasting.

Because they largely make use of lifelike photography and sound recordings, it might be said that films as a class provide lifelike representation. Nevertheless, a particular sort of film expression is the concern of simulacrics. Let us call it "fully naturalistic" expression. It is lifelike because it is thoughtlike.

In the body of this article I hope to make plainer what I mean by these terms, but I want first to emphasize two primary points about simulacrics—its general incidence and pragmatical character.

A possible science of lifelike films would not be merely related to artistic expression, although that is likely always to remain a supremely important application of simulacrics; but to educational, psychological, and other uses, in fact all those uses outside the field of art and entertainment for which films are being increasingly employed, including the training and testing of people in situations of actuality, and to uses we cannot now foresee. Simulacrics has a generality of incidence approaching that of communication, because lifelike representation permits a uniquely direct and powerful kind of communication.

The other aspect of simulacrics I want to stress is its pragmatical character. The conception of simulacrics is of a possible science. It is not concerned with what through *a priori* reasoning we might think would be the effect of different kinds of film features, nor simply with terms as such, or what a thing should be called; it is concerned always with what is lifelike, in a total result, to the senses.

It is important to make this point clear, because there is often confusion and misunderstanding over terms like "lifelike" and "naturalistic" (terms which are in any case used differently by different people).

A simple illustration may help. Is the colored or the black-and-white film image the more lifelike? Perhaps reason might say the colored film was more lifelike, because objects in the actual world are colored. It might even be argued that in any case the colored film is correctly *called* the more lifelike.

Simulacrics would not base its conclusion on any such *a priori* reasoning or any such terminological considerations. The answer it would give to this question would depend on a total result to the senses when on one hand a black-and-white film image was projected and on the other hand a colored image, in an appropriate context and in all the circumstances of cinema projection.

An addition to the film image leading to an even stronger *a priori* logical and terminological judgment is the addition of sound. It will perhaps be argued strongly that the film image of a dog barking is rendered more lifelike when the sound of the bark is added.

But again the adherent of simulacrics will make no such *a priori* assumption about it. He will be guided by a total result to his senses in the two cases when the two kinds of image are projected before him.

Of course the comparisons that will have to be made to arrive at principles and conclusions of simulacrics are likely to be about more complicated entities than two isolated film images with only one varying feature. It would be necessary rather to compare two media of which the images were elemental samples, for example, to compare a whole succession of images seen in color with a whole succession seen in black and white.

Simulacrics would examine such features of film images, and more especially combinations of such features, and various film methods that have already been practiced or might be devised,

examining these features and methods always in connection with their potential capacity to produce lifelike effects—and that may amount to the same thing as examining them in relation to man's perception and thought processes in ordinary life (when not watching films).

A justifiable general criticism of research work on films up to date is that too little attention has been paid to the existence of completely different kinds of film expression. There has been a tendency to lump films together. To grasp the conception of simulacrics, it is very necessary to realize that some film means allow effects and a form of mental response that others exclude.

The portrait painter with his flat canvas cannot hope to achieve the effects of a sculptor, and there is an even sharper divergence between what different film media allow. It is not a question of a good or a bad medium, or in a general sense of a better or a worse one, but simply of different media.

Which of two alternative media is the better will depend on the purpose of the representation. Do we, for example, wish the film viewer to watch and listen to something going on outside him, or do we wish the performance, so to speak, to take place in his own head—and even make sacrifices of formal generalization and literal interpretation to achieve that extreme kind of involvement.

Like literary composition, film expression requires at least a moderate ability and may require the highest sort of imagination. Nevertheless, granted all the necessary gifts, the film maker is allowed or excluded from possibilities of effect and consequent audience response, according to the film features and methods he uses. Simulacrics is concerned with examining the conditions that—quite apart from those of human intention, ability, and so on—allow or exclude lifelike expression.

METHODS OF FILM EXPRESSION

A very brief allusion to film history will not only convey an idea of the many film features and methods that exist to be examined, but should make plainer what is meant by lifelike expression.

In film history will be found examples both of fully naturalistic expression and what in contradistinction may be called conventionalized expression. Communication by films has been partly by the direct method of images and partly by the indirect one of formal symbols (including written and spoken speech) and formal conventions.

There has been to some degree a combination of these two methods during the same period, and even within the same film. Indeed it is almost as difficult to find the example of a fully naturalistic film as a fully conventionalized one, but nevertheless one or other of these methods has been predominant and characteristic in certain periods.

Apart from the intentions, faculties, and idiosyncrasies of film makers, physical features of the film and current practice have determined the method used. By physical features, I mean such features as silence, color, music, sound, speech, 3-D, very large screen, and so on, and combinations of these features.

Two influences worked on film makers at the very start—the influence of verisimilitude leading them to record reality as the photographer might (even when that reality was the fabricated one of studio sets, actors, and so on), and the influence of traditional art leading them to model films on stage art. In spite of such exceptions as the remarkable little film *Excursion* made by Oskar Meister in 1898, with its changes of points of view and close-ups of the bicyclists' legs, stage art largely determined the rudimentary film craft that first became established. But we may note that even the early film makers most influenced by the stage often used naturalistic settings and realistic details, and that from the beginning "silent" black-and-white films were accompanied by music.

With increasing practice and precedent, the film makers of about 1910 began to utilize the fluidity of their medium not only to accord with what seemed to them visual fitness (giving rise to visual rhythm), but also to tell the story and to create mood. It began to be realized—dimly at first and in no formulated way—that the film was essentially not made up out of scenes like a play but out of smaller elements—film shots.

With a few film makers, such as D. W. Griffith, this realization determined practice. To a limited degree there were in early films departures from strict chronology and occasional fastening upon detail. Even by 1916 the psychologist and philosopher Hugo Muensterberg could refer to the film's capacity for directing attention, for bringing together events as "in our consciousness" (14). In this way was reached the fullest development so far of communication through the direct method of images.

The conditions which make this kind of communication possible, and they are conditions applicable whether the film is silent,

sound, 3-D, or any other, are—as I would personally analyze it—the maintenance of a very high degree of "illusion of reality" in the elemental images and the maintenance of "ease of change" of those elements (i.e., the maintenance of an absolute fluidity in the medium).

Only if each elemental image presented is as good as real to us, and only if there is constant and yet easy change of those images, can thought be matched, can a stream of consciousness be reflected and imposed, as that can almost be said to have been done by portions of certain films, especially silent films (16, 17).

Perhaps the German expressionist films, *The cabinet of Doctor Caligari* and *Warning shadows*, demonstrate the direct method of communication through images as well as any film. A shot-breakdown of these films reveals in the succession of images fallings away from logic and strict chronological order, little jumps (as of consciousness), intertwinings of events (as are events of actuality that are perceived as simultaneous by the mind or as all part of a single situation), and precolorings (as these occur in thought of something we relive).

But this strange jumble of elements (as it occurs in consciousness itself) only exists for the cold detached eye at the editola. Seen straightforwardly on a screen, as these films are normally seen, there is for the viewer no sense of confusion, but instead a most rapid and satisfying unfolding of story, plot, experience, or whatever we may care to call it (15).

All this could happen because the black-and-white silent film allowed images as real as those of perception and thought when not watching films, and because there was absolute freedom and ease to change and present these images in succession. But apart from these early German films, silent films during 1919-1930 very generally exemplify the direct method of communication. In speaking of lifelike films we are certainly not speaking of something merely theoretical.

The introduction of sound produced a complete change. Generally speaking, the medium became one of indirect expression. There was in fact required for the "taking in" or comprehension of talking films an intervening process of translating linguistic and other signs, just as that intervening process is needed when reading a book or watching a play. The unique direct method had been superseded.

In the film of the normal dialogue type one's attention is largely taken up with attending to words, because words are largely used to delineate character and tell the story. With the picture-cum-commentary type of film that is also mainly true, because the words provide additional information and vital connecting links. Indeed with some instructional films the visual images are best described as providing graphic illustration for what is said.

Apart from the necessity of attending to what is said, and perhaps partly because of it, it may be argued that the addition of speech has led to a crucial lowering in the "illusion of reality" of the film image. We are aware in the dialogue film, and in measure in the commentary film, of representation as we were not aware of it in the days of the silent film.

Precisely why the introduction of speech that has to be listened to for meaning should make such a complete alteration in the effect of film expression as it seems to do is a question which simulacrics would deal with, providing eventually, it is hoped, objective means of testing, in place of subjective individual testimony, and examining ways in which speech might occur in films without destroying lifelikeness.

Simulacrics, I would stress again, is pragmatical: its conclusions must always depend on how a thing works in practice. But predictions and hypotheses, so long as they are not treated as facts before they have been proved, need not be harmful, and they set the pattern for experiments. Then one may mention that there are a number of possible reasons why sound and, in particular, speech should decrease the lifelikeness of films. Very briefly some of these possible reasons are—

1. A *difference of dimensions* between what is seen and heard. We see the image on a flat surface, we hear the words coming out of space. Dr. Arthur Kutscher, an authority on drama, says of the addition of speech to the visual image: ". . . no organic unity has thereby been created, because aural utterances are tied to physical presences, to space, and appear as strangers in the simulated world of planes and pictures, rather like a relief on a mural" (19).

2. *Conflict in the mind* over what is seen and heard. What is seen and what is heard often do not seem inherently to belong to one another. The bell we see on the screen would not, we think, sound like that. The interpretation in words of the situation visually presented varies from the mind's own interpretation of it.

This last kind of conflict can arise acutely in the case of commentary films. The indications provided through commentary may add much information, and in the case of an educational film be highly valuable, but nevertheless they can completely destroy lifelikeness.

3. *A decrease of visual concentration* because our attention is largely taken up with listening to words. We are kept aurally alert. The occurrence of speech in a film at all creates a certain form of psychological reception for the audience, not only for the shots in which speech is heard, but in measure for the whole film; and this form of reception is not that of the direct type of communication.

4. *The increased length of shot* generally consequent on the use of synchronized speech.

During the thirties the dialogue film and the commentary film were fairly quickly developed to their present form; and, although of course, there have been a number of subsidiary forms, such as the monologue film, these remain the types of sound film of established practice.

The greatest change wrought in film expression has come about through the introduction of sound, although several new physical features have been introduced into films subsequently, including within the last decade 3-D films and the very large screen film (e.g., Cinerama).

Both solidity and engulfing size are features of the greatest importance in relation to lifelike effects. Moreover, they seem to have importance in relation to the use of speech in films. For example, there does not seem to be the same fall-off in lifelikeness when sound accompanies the 3-D image as when it accompanies the 2-D image. Solidity and engulfing size are clearly both features whose effects, when in combination with other features, would have to be carefully studied by any science of simulacrics.

But neither 3-D nor very large screen films have yet become the films of established general practice. The screen of the ordinary cinema has widened without increasing in height. This mere increase in width seems to make relatively little difference to the lifelike effect, although we may relevantly note that quick-cutting and close-ups are ill suited to the wide screen, and that the length of shots has tended to increase.

PSYCHOLOGY

We have seen how past and present film making suggests hypotheses and theories for the first experiments and a preliminary drawing up of the axioms of simulacrics. Likewise, because the life-like film is equivalent to the thoughtlike film, a study of psychology is relevant. In a summarized and simplified form, I give below a few results of such a study. Again I hope that in doing so I may further clarify the conception of simulacrics.

Perception (4, 18)

Visual perceptions play a predominant part in telling us of the outside world. Next in importance are aural perceptions. Films as we know them at present utilize primarily these two kinds of perception. But one sense can readily invoke another—in a process known in psychology as synesthesia. Silent film shots of breaking waves can lead us to hear the waves; close-up shots of the daffodil can lead us to smell the flower.

In actual life there is an indistinct edge to our field of vision; in film representation there is a delimited frame. In actual life we see the world by scanning, that is, by a continual and rapid movement of the eyes from point to point. In some activities of everyday life a separate fixation of the eyes may be a fraction of a second's duration. In film representation scanning is confined to the screen, but the constant change of scene in some types of films would seem to take the place of scanning.

Both on account of this visual scanning and on account of the constant changes in consciousness when living or reliving experience in actual life, it would seem there must be *constant change* in a film if it is to remain lifelike. This may explain why even the most realistic film shot loses its "illusion of reality" if held before us for a long time.

Films are in tones of black and white or in colors which do not perfectly match those of ordinary nature, and which have an inordinate brightness—owing to our enlarged pupils (9).

In actual life a sense of depth is conveyed through binocular vision and accommodation (or lens alteration) of the eyes for relatively close views; but many other clues of texture, shade, color, and surface contact (4), and clues from bodily movement provide us in more distant views with a sense of depth (all these clues in more distant views being clues which films can provide).

It is unquestionable that the world presented us by two-dimensional films appears three-dimensional: a man walking away from us on the screen appears as such, and not as a man dwindling in shape in one plane. Also we may have the most positive and exact sense of our own bodily movement (in a world of depth) through visual stimuli alone.

In relation to lifelike films one of the most important facts of aural perception is that in actual life a threshold-consciousness controls the sounds reaching our full consciousness. This selective hearing can be perfectly simulated by films. Our power of locating sounds is rather limited; in actual life we often hear sounds without knowing precisely from where they come. Our reaction time to take in a sound is faster than that to take in a sight.

In noting likenesses and differences of perception of the actual world and of the world presented by films, it is important to remember that films are not so often employed to give a sense of being in certain surroundings—although they are fully capable of doing that—as to give the sense of a total situation, of living through or experiencing a total situation.

It is important to bear in mind also that by illusion of reality is meant something more than a mere illusion of solidity. In certain films providing illusion of reality objects appear (to thought) as though they really existed—to be touched and smelled, and possessing in every particular the attributes of a real object. The "reality" of films has been affirmed, and qualified, by psychologists, notably by Michotte and Muensterberg (11, 12, 14).

Consciousness (2, 3, 6, 8)

In films we are concerned not simply with elements as such, but with arrangements and successions of elements. That would appear true also of consciousness.

We cannot, according to our normal usage of words, dissociate consciousness from what we can immediately recall (1). It is this aspect of consciousness that is relevant in relation to films. It is discriminative experience and recall that the fully naturalistic film can reflect and impose.

Apart from its constant change, we see then that another main characteristic of consciousness is that it is selective.

Perhaps for scientific purposes the stuff of consciousness may ultimately be reduced to temporary physiological states of the

brain. These neural sets may be caused by direct sense experience or revived sense experience (images). But some psychologists speak of thoughts *of* or thoughts *about* occurring in consciousness "having little or no sensory or imaginal content" (3).

Of images Bartlett notes:

> In one important respect, words and sensorial images are alike: both act as signs indicating something else which need not be perceptually present at the moment. Thus they are both instruments of the general function of dealing with situations or objects at a distance (1).

The dream is a special sort of consciousness called *preconsciousness,* and seeming to correspond to consciousness in the freest, most elemental form. Dreams seem to consist of a succession of images which are primarily visual. Through such a succession we are made aware of certain surroundings or of a certain situation. There is a complete lack of the overt manipulation of symbols in dreams: there is no open conveying of meaning or statement. But dreams have an extraordinary vividness and reality for us. We live through the most absurd situations as though they were actual, as though we were awake—in actual life. Dreams are real in the same way as the films with which simulacrics deals (10).

What may be called waking dreams are of frequent occurrence, and some accounts of these made in 1883, before even the most primitive film art existed, show how fully films reflect the mind's own natural processes of visual thought (3).

The capacity of consciousness is limited (18). If, then, this capacity is to be catered to most efficiently, we must use the most efficient of alternative means—such as the alternative means of sight, sound, and speech offered by the sound film. A combination of the means will not necessarily be more effective than one of the means used singly.

The "inertia of attention" exceeds in time duration persistence of vision and must be a considerable factor in welding together the effects of properly arranged film shots.

Language and Consciousness (5, 7, 13)

Language stands distinct from thought, although sorting out and solving problems can be greatly assisted by language. At a primary level of consciousness, words—or at any rate words in grammatical sequence—do not occur.

Language has primarily developed as a means of communication. It is almost incidental that, as well as being a means of

describing consciousness and thought, it has become a valuable aid to thought.

Language, as it first occurs in thought, and in our first attempts to describe thought and consciousness, occurs as single words and truncated phrases which Humphrey has called "a kind of stenogram of the thought" (7).

Of course we are conscious of words when spoken and we may listen intently. We may then temporarily forget the general situation in which we are placed in order to understand what is indicated by the words, another situation. The words we hear will be translated eventually into the neural sets forming the elemental stuff of consciousness. These words are not inextricably associated with these neural sets as we imagine sense images are.

From the point of view of simulacrics, what is important to remember is that at a primary level of consciousness words—or at any rate words in grammatical sequence—do not occur.

SUMMARY

This article has described simulacrics as a field of study and a possible future science of lifelike representation, and has considered some of the material of film practice and of psychology related to this field of study. The lifelike film is lifelike because it is thoughtlike.

Simulacrics is general in its incidence; it is pragmatical, being concerned with results, not with what reason might suggest beforehand, and not simply with nomenclature.

Simulacrics would examine various physical features of films (such as color, sound, speech, and solidity) and combinations of those features, always with regard to lifelike effect; it would examine the conditions necessary for lifelike representation irrespective of human intention, ability, and so on.

A study of film history suggests that these necessary conditions are the maintenance of "illusion of reality" and "ease of change," of the elements making a film.

Both on account of visual scanning and of the mode of consciousness during normal life, there would seem to be a need for constant *change* in the lifelike film.

Of aural perception, a feature of prime relevance is that hearing is selective—and this can be perfectly simulated by films.

Psychologists have insisted on the selective character of consciousness as well as on its constant change. Some psychologists

think that thoughts *of* or thoughts *about* occur in consciousness having little or no sensory content. But if this is true, it is also true that a considerable proportion of consciousness is that of sense experience or revived sense experience (imagery).

Dreams seem to consist of a series of images, primarily visual. Between the lifelike film and the dream there is a striking similarity.

* * *

The author hopes that this paper will stimulate interest in the concept of simulacrics and encourage others to create and test hypotheses which will lead to the development of a science of lifelike representation in motion picture films.

REFERENCES

1. BARTLETT, FREDERIC C. *Remembering; A Study in Experimental and Social Psychology.* New York: The Macmillan Co., 1932.
2. BORING, E. G. "Consciousness." *Encyclopaedia Britannica.* London: William Benton, Publisher, 1953.
3. GALTON, SIR FRANCIS. *Inquiries into Human Faculty and Its Development.* New York: E. P. Dutton and Co., 1908.
4. GIBSON, JAMES J. *Perception of the Visual World.* Boston: Houghton Mifflin Co., 1950.
5. HEAD, HENRY. *Aphasia and Kindred Disorders of Speech.* New York: The Macmillan Co., 1926. Vol. 1 and 2.
6. HEIDBREDER, E. "Thinking." *Encyclopaedia Britannica.* London: William Benton, Publisher, 1953.
7. HUMPHREY, GEORGE. *Thinking: An Introduction to Its Experimental Psychology.* New York: John Wiley and Sons, 1951.
8. JAMES, WILLIAM. *The Principles of Psychology.* New York: Dover Publications, 1950.
9. KLEIN, ADRIAN B. L. *Colour Cinematography.* London: Chapman and Hall, 1936.
10. KLEIN, D. B. "Dreams." *Encyclopaedia Britannica.* London: William Benton, Publisher, 1954.
11. MICHOTTE, A. "Le caractère de 'réalité' des projections cinématographiques." *Revue internationale de filmologie.* Special issue. October 1948. p. 249-61.

12. MICHOTTE, A. "L'enigme psychologique de la perspective dans le dessein linéaire." *Bulletin académie belgique de lettres,* 5e série, tome 34. 1948. p. 268-88.

13. MILLER, GEORGE A. *Language and Communication.* New York: McGraw-Hill Book Co., 1951.

14. MUENSTERBERG, H. *The Photo-Play: A Psychological Study.* New York: D. Appleton and Co., 1916.

15. PEGGE, C. DENIS. *"Caligari:* Its Innovations in Editing." *Quarterly of Film, Radio, and Television* 11:136-48; Winter 1956.

16. PEGGE, C. DENIS. "The 'Silent' and the 'Sound' Film." *University Film Journal,* No. 2. Summer 1953. p. 4-8.

17. PEGGE, C. DENIS. "Thought Processes and the Film." *University Film Journal,* No. 9. Autumn 1955. p. 3-8.

18. TITCHENER, EDWARD B. *Text-book of Psychology.* New York: The Macmillan Co., 1910.

19. WOLLENBERG, HANS H., editor. *Fifty Years of German Film.* Translated by Ernst Sigler. London: The Grey Walls Press, 1948.

AV ACTIVITIES OF EXTENSION DIVISIONS IN TEACHER EDUCATION

• ROBERT E. de KIEFFER

This is the second in a series of articles which indicate the extent to which audio-visual methods and techniques are being incorporated into the preservice and in-service teacher education programs in the forty-eight states. Robert E. de Kieffer is director of the Bureau of Audio-Visual Instruction, University of Colorado.

UNIVERSITY extension divisions, for more than four decades, have played a vital leadership role in the audio-visual field.

Not only have they provided schools with various audio and visual materials which were too costly for the individual schools to purchase, but they have contributed greatly to the training of teachers in the effective utilization of these materials. Long before most teacher education institutions had hired full-time audio-visual personnel, the professional extension division workers were holding conferences, workshops, and other types of training programs in this area.

To the extension divisions of four-year institutions should go the credit for fostering the theory that students learn more from what they see, hear, and do, than they can by mere rote memory and verbalization.

At the time of the 1947 study, it was decided to consider only the general university extension divisions which were members of the National University Extension Association. This decision was made because of the variable and complex organization of extension activities carried out by colleges and universities. It was believed that those extension divisions which had well-organized programs would naturally be members of the association.

In 1947 there were 65 active member divisions of which 56 or 86 percent returned the questionnaire. Ten years later there were 76 active members of which 70, or 92 percent, returned the questionnaires.

While it is difficult to make comparisons between the audio-visual activities of extension divisions over a period of 10 years, this report is intended to show the changes which have occurred. It should further be remembered that the statistics in this report are of a quantitative, not a qualitative, nature. The thoroughness with which an audio-visual department carries out any of its stated functions may change from year to year.

The reader will recognize that both studies contained the same basic information, the method of procedure was identical, and the type of institutions reporting were basically the same. However, care should be taken in comparing the findings of these two studies from a numerical or a percentage point of view. Trends can be identified which will indicate the changing roles of extension divisions in the audio-visual area, and these facts and figures can be of great assistance to students, researchers, and professional people in the field.

SEPARATE AUDIO-VISUAL DEPARTMENTS WITHIN UNIVERSITY EXTENSION DIVISIONS

Of the 70 university extension divisions returning the 1957 questionnaire, 45, or 64 percent, reported that their divisions had audio-visual sections or departments. This increase in the number and percent of extension divisions engaging in audio-visual programs is consistent with the growth in this type of activity in both state departments and four-year institutions of higher learning.

In 1957, 26 university extension divisions answered "No" to the question: "Is there an audio-visual department within your division?" Among this group, four reported that such services were under other administrative divisions of the university as follows:

4 under the Library
3 under the College of Education
2 under the President's office
1 under the Center for Mass Communication
1 independent of any division or department.

FORMATION OF AUDIO-VISUAL DIVISIONS

Between the years of 1914 and 1920, six university extension divisions had created audio-visual departments. There were probably several factors which stimulated the almost simultaneous development of these departments at this particular time. Among the most obvious ones are the following:

1. Many extension divisions had previously distributed lantern slides, post card sets, and stereopticons. As collections and demands for these materials grew, separate departments were established to handle the administrative details.

2. During this period the 35mm silent motion pictures were developed, and the federal government deposited military and civilian training films with many university extension divisions in hopes that they would be used for educational purposes.

3. Several far-sighted extension division administrators, such as William H. Dudley and others, made fiery orations at the national conferences of the National University Extension Association in support of these new media of communication and their future importance in education.

During the following decade, 1920 to 1930, five more departments were established. Slow but continuous growth took place until just prior to the American entry into World War II in 1940.

In a short period, from 1941 until 1950, the number of audio-visual departments doubled. This rapid growth was the direct result of the civilian war effort and the extensive use of audio-visual materials in the training of a civilian military force.

The federal government, in an effort to stimulate interest in the purchase of War Bonds, provided university extension divisions with hundreds of 16mm sound motion pictures and assisted them in developing an extensive system of distribution. The effectiveness of this plan can be readily recognized when it is realized that during the last War Bond drive, over 8.5 million people viewed the Office of War Information's 16mm films.

An additional factor which stimulated the rapid development of audio-visual departments was the training which many educators received during their military service through the use of instructional materials. Extension divisions were practically devoid of all able-bodied personnel for military service where money, manpower, and materials were abundant. These people

were given an opportunity to experiment boldly with various media of communication in an attempt to increase the amount of learning of trainees in a shorter period of time. At the end of World War II, many of these people returned to their extension division jobs and, having seen what could be done with instructional materials in military training, organized audio-visual departments within their divisions.

From 1951 to the present, only four new departments have been formed. While it might at first appear that the interest in establishing new departments was tapering off, it must be recognized that all but a very few of the university extension divisions had audio-visual departments or similar services on their campuses which regulated further growth in this direction.

Personnel

The type and number of personnel in any organization usually indicate the magnitude of its operation. The total number of full-time personnel employed in extension divisions has increased from 228 in 1947 to 484.5 in 1957, and the part-time personnel from 268 to 586. The mean number of full-time employees was 6.3 in 1947 and 10.5 in 1957. The mean number of part-time personnel was 7.4 in 1947 and 12 in 1957.

Distribution of Materials

As was stated earlier, one of the primary services which audio-visual departments of various university extension divisions render is the distribution of materials and, in some cases, equipment to schools, churches, their own academic departments, and other agencies. While in 1947, 35 of the 36, or 97 percent, of the departments distributed materials, by 1957, all 45, or 100 percent, of the audio-visual departments were engaged in such distribution. While 16mm sound motion pictures head the list of materials distributed in 1957, the prerecorded magnetic tapes were the second most often mentioned item distributed by these departments. In the 1947 survey, tape recordings ranked fifth in importance. This is an indication of the way in which the audio-visual departments have changed their pattern of service to meet the instructional material needs of their patrons. Thirty-six institutions are distributing 3¼ x 4 slides, 35 millimeter filmstrips, and transcriptions. It is interesting to note that 2 x 2 slides are taking precedence

over the older 3¼ x 4 slide material. This again shows that extension divisions are changing the type of material they distribute in keeping with the latest developments in the field.

Other types of materials which were mentioned as being distributed were: books and bulletins, study prints, exhibits, flannel boards, photographs, radio scripts, charts, and phonographs.

OVERVIEW OF THE TEACHER EDUCATION SITUATION

The university extension divisions have been in a unique situation to assist with the pre-service and in-service education of teachers in audio-visual methods and techniques.

With reference to pre-service education, extension divisions have a large amount of audio-visual materials and equipment, and well-trained staffs who have a firsthand knowledge of how these materials and techniques can be used most effectively in improving instruction. It is little wonder that colleges of education have called upon their extension divisions to assist them with the pre-service education of teachers in this field.

In the area of in-service education, university extension divisions are committed to assisting teachers in the field in making the most effective use of audio-visual materials. One of the basic functions of university extension divisions is to serve the people of their area or state as an educative body outside the walls of the institution. In addition, these extension divisions have large collections of audio-visual materials which they distribute. It is logical to assume that the administrations of audio-visual divisions are not only anxious to see that these materials are correctly used, but that they are not damaged nor destroyed.

The number and percentage of university extension divisions who claim to assist with the pre-service education of teachers changed from 28, or 52 percent, in 1947, to 37, or 65 percent, in 1957. This phenomenon might best be explained by the fact that more institutions having audio-visual divisions in their extension divisions are taking advantage of the staff, materials, and equipment whch are readily at hand. Colleges of education, seeing what has been done audio-visual-wise for the elementary and secondary schools of their state, have requested that the various services be extended to include their own institutions. Among the services requested has been the provision of qualified teachers to give audio-visual courses for pre-service teachers.

The percentage of extension divisions which offer assistance to in-service teachers remained constant at 72 percent from 1947 to 1957, although the total number of divisions offering such service rose from 39 to 41. Among divisions in the remaining 28 percent in 1957 are those which stated that this area of service was completely lacking in their program because of the nature of their organization and administration.

TYPES OF PRE-SERVICE ACTIVITIES

In obtaining more specific information concerning the nature of pre-service teacher education in audio-visual methods and techniques, the extension divisions were asked four questions:

1. Does the division furnish all necessary materials and equipment for such instruction?

2. Do the staff members of the extension divisions teach the audio-visual courses?

3. Does the extension division furnish the laboratory in which classes are held?

4. Does the extension division furnish technical assistance in the development of audio-visual programs in the training of pre-service teachers?

In answer to all questions, while the number of extension divisions offering these services increased from 28 in 1947 to 37 in 1957, the percentage for each item decreased.

The replies indicate that in 1957, 30 institutions, or 81 percent, offered the first service mentioned, as compared with 26, or 93 percent, in 1947. This item dropped in importance from first to second place. It is presumed that more colleges of education are procuring the necessary equipment for such instruction.

A comparison in the number and percentage of divisions in which staff members are teaching audio-visual courses indicates that in 1947, 24, or 86 percent, were teaching such courses, while in 1957, 29, or 78 percent, were so engaged.

Over the period of the past 10 years, only one additional division furnished laboratories where classes were held. In 1947, 23, or 82 percent, furnished laboratories; while in 1957, 24, or 64 percent, made such claims.

In answer to the last question in 1947, 25, or 89 percent, furnished technical assistance; in 1957, 31, or 83 percent, furnished

such assistance. This service rose from second to first place in importance. It is significant to notice that extension divisions have seemingly impressed colleges of education with the importance of audio-visual education for pre-service teachers and pointed out the need for these colleges to provide equipment, facilities, and staff for such teaching.

TYPES OF IN-SERVICE ACTIVITIES

The services provided by extension divisions for the education of in-service teachers in audio-visual materials seem to cluster around five areas. These are:

1. Short courses
2. Correspondence courses
3. Off-campus classes
4. Conferences and institutes
5. Publications.

In 1947, 39 extension divisions averred that they provided services to in-service teachers; in 1957, 41 made such claims.

Short courses, for the purpose of this study, may be considered as units of instruction of less than one semester in duration for which academic credit may or may not be given. These courses may or may not be held on the campus and are usually designed to meet the needs of teachers who are unable to take more intensive or extensive work in the area.

The number and percentage of extension divisions offering short courses in audio-visual education dropped from 25, or 64 percent, in 1947, to 22, or 54 percent, in 1957. While this technique seems to be losing favor, other types of services have increased to compensate for this loss. It may be that other methods have proved to be of greater value.

Of minor significance is the increase in the mean number of class hours devoted to short courses: from 32 in 1947 to 44 in 1957.

Three institutions in both studies reported that no academic credit was given for audio-visual short courses. The mean number of credit hours given was 2.5 in 1947, and 2.7 in 1957. The total number of teachers taking such courses in 1947 was 3427, and 3256 in 1957.

In answer to the question, "Under whose auspices were these courses (short courses in audio-visual education) offered?" 11 claimed that these activities were carried on under the auspices of

the college of education. (This is a shift in emphasis from 1947 when only three so reported.) Six stated that they were conducted jointly with the education division, and five claimed to be offering short courses under their own auspices.

The shift in emphasis from extension divisions offering short courses on their own, to sponsoring them with the schools or colleges of education or having these schools or colleges take total responsibility, re-emphasizes the gradual recognition which schools and colleges of education are giving the audio-visual field.

Approximately the same number of extension divisions (15 in 1947, 13 in 1957) claimed that other administration units of their institution also offer short courses in audio-visual methods and techniques.

Correspondence courses are still not being offered to any great extent in this field. Many institutions claim that because of the extensive laboratory work in audio-visual courses, satisfactory correspondence courses are difficult to offer. In 1947, only one extension division offered such a course. In 1957, three divisions made such claims. Replies indicated that 57 students completed this course in 1957.

Off-campus classes, to be distinguished from short courses, are generally considered as continuation courses for students, conducted in communities away from the campus, as regular semester courses and offering full university credit upon completion. From the questionnaire replies, it appears that this type of activity has increased over the past decade from 23, or 59 percent, in 1947, to 34, or 82 percent, in 1957. The number of students completing these courses increased from 2800 in 1947 to 6972 in 1957.

The operation of equipment is considered an extremely desirable activity in audio-visual courses. While only 19 of 23 divisions gave students this opportunity in 1947, all of the 34 divisions currently offering off-campus courses in this field provide the opportunity for students to operate equipment.

Thirty of the 34 courses were given under the auspices of the extension divisions. Of the other four, they were offered as follows: two under the joint sponsorship and auspices of the College of Education, one under the Library, and one under the Business School Services.

Of the 34 institutions offering off-campus courses in audio-visual materials and techniques, 21 offered only one course. All

others offered more than one. A total of 49 courses are currently being offered, as opposed to 30 such courses offered in 1947.

The range in the amount of university credit allowed for completion of such courses is from 1 to 3 semester hours with a mean of 2.9. This is a slight increase over 1947 statistics when the mean was 2.6.

The mean number of class hours devoted to such off-campus courses has risen from 44 in 1947 to 49 in 1957. It is interesting to observe that the audio-visual courses offered through off-campus classes have not only increased in number, but also in semester hours, and obviously in the total number of class hours devoted to them.

The development of off-campus courses has been an alarming development. From the period 1927-1945, progress was slow: only five such courses were offered. By 1946, 18 courses were being taught, and by 1951, 40 courses were in existence. The number of additional courses offered over the period of the next five years was not comparable to the rapid increase over the former 10-year period. Although it does not appear that additional courses will cease to be offered, a definite plateau seems to have currently been reached.

Conferences and institutes still appear to be one of the more popular types of in-service educational programs conducted by extension divisions. Although the total number and percentage increase in the number of off-campus courses is offered by more divisions, conferences and institutes are the second most frequently offered service of extension divisions.

The range in the number of clock hours devoted to these conferences and institutes in 1957 was from 3 to 72, with a mean of 12 hours. (In 1947 the mean number of hours was 8.7.) While in 1947, 37,902 teachers attended such conferences and institutes, only 2863 were in attendance in 1957. The fall-off in attendance is probably due to several factors. First, teachers are anxious to receive academic credit for work done. Seeing that most conferences and institutes do not usually offer credit for work taken, enrollments are light. Secondly, more extension divisions are offering increased off-campus courses. Thirdly, a greater proportion of four-year institutes are offering audio-visual courses during the pre-service education of teachers. It is further presumed that the nature and content of these conferences and institutes has

changed from that of purely introducing neophytes to the field, to that of professional advancement of audio-visual workers.

Of the 29 extension divisions replying to this question, 21 claimed that such conferences and institutes were offered by extension divisions. However, only 12 claimed that they followed up such activities with individual school visitation.

Publication of audio-visual materials and techniques specifically for in-service teachers has dropped in importance from first to third place during the past 10 years. In 1947, 29, or 74 percent, published such materials, while 25, or 61 percent, were engaged in such publications in 1957. The reason for this decrease is not clear to the author. It is presumed, however, that some of the publication load in this field has been assumed by state departments, as well as state and national audio-visual associations, making it unnecessary for the extension divisions to engage in such a wide variety of publication activities.

The type of materials published by extension divisions has not changed in the past decade. The degree of emphasis placed on various types of materials has not changed either.

The type of material most often listed by the extension divisions was film and other material catalogs and supplements, followed by general bulletins concerning audio-visual methods and techniques. This type of publication is understandable when it is recognized that many of the extension divisions have film and tape libraries, and, therefore, must supply their customers with catalogs. In addition, these divisions are concerned with the over-all improvement of instruction and are interested in promoting the effective utilization of audio-visual materials for this purpose.

EXTENSION DIVISION ASSISTANCE TO INDIVIDUAL SCHOOLS

Another way by which extension divisions participate in the in-service education of teachers is by assisting individual schools with their own audio-visual problems. Sixteen divisions reported that they are offering such assistance. A total of 1706 schools received such assistance during 1957. No comparable data are available for the year 1947.

This type of school visitation and assistance is one of the most practical and valuable types of service which can be rendered, because it is a direct and specific method of helping teachers and administrators help themselves.

CURRENT DEVELOPMENTS IN COMMUNICATION

NAEB RESEARCH SEMINAR FOR EDUCATIONAL TELEVISION AND RADIO

Edited by

• I. KEITH TYLER

To review the status of research in educational broadcasting, assess its adequacy in the light of contemporary requirements and propose a program of urgently needed research, 23 research specialists from organizations and institutions engaged in educational broadcasting participated in a five-day Seminar on Research in Educational Broadcasting. The Seminar was sponsored by the National Association of Educational Broadcasters with funds provided by the W. K. Kellogg Foundation. Management responsibility was handled by The Ohio State University, which also generously contributed the services of many members of its staff. The Seminar was held December 9-13, 1957, on The Ohio State University campus in Columbus. I. Keith Tyler, editor of this Seminar report, is director of Radio-Television Education and professor of educational research at The Ohio State University. For the past few years, Dr. Tyler has been director of the annual Institute for Education by Radio and Television.

TYPES OF RESEARCH IN EDUCATIONAL BROADCASTING

The attempt to categorize research frequently results in imposing somewhat arbitrary values on particular problems, methods of investigation, and research conclusions. For example, some think pure research is better than applied research, laboratory research superior to nonlaboratory research, and basic research more desirable than action research. In principle, we believe that the method of research is a product of the nature of the problem under study and that its association with prestige or status, relating to familiar ways of working, is of secondary importance. We believe it is helpful to classify research in order better to use our resources of time, talent, and money.

Much of the research in broadcasting may be considered to be applied research. The objectives of such research are to bring about improvement at the point of action. If one views educational broadcasting primarily as a learning process, then basic research in the field of learning theory is a main source of concepts and methods used in the applied research on these media. With the foregoing in mind, it is possible to identify the major forms of research methods applicable to educational broadcasting.

We distinguish two types of research in this area: (a) *basic research* and (b) *action research*. They may be distinguished by determining what is intended in the particular design, even though the two types are interrelated, each contributing to the other.

By *basic research* we mean that research which is intended to discover major principles and generalizations. Such research may proceed from the theoretical formulations found in related fields, and need not necessarily originate within broadcasting. This type of research is essentially intended to produce new knowledge, principles, and theories. It is the *newness* of the knowledge we would wish to stress in this definition and not its general value or applicability to broadcasting. Such research, if well done, often provides a basis for a large range of decisions and actions by educational broadcasters at all levels of activity from management to programming.

By *action research* we mean systematic inquiry intended to improve procedures in action situations. In educational broadcasting, an "action situation" might be the total programming of a particular station, a single program, the organizational pattern of the station; or, the "situation" might be a network or a pattern of financing. The research would involve the testing of alternative patterns of action or the evaluation of a particular pattern within these situations. As in any research, methods and rationales employed should be rigorous and carefully conceived.

Educational broadcasters must often demonstrate the effectiveness of their media, in order to promote use of the facilities and to teach others how they may be used. This activity meets a real need, but should not be confused with research. Such demonstrations may or may not involve the methods of inquiry, but the results are known in advance. Thus, while gathering data may be a part of the demonstration, the fact that the results are predictable precludes calling this activity "inquiry" or "research."

NEEDED RESEARCH IN EDUCATIONAL BROADCASTING

This Seminar concludes that educational broadcasting has such contemporary and long-range significance as to require (a) a comprehensive program of research over an extended period of time, and (b) an attack upon certain vital studies in the immediate future. This document attempts to delineate both the immediate and the long-range problems and to summarize generally accepted approaches to the problems.

We hope that this report will call attention to critical areas of research pertaining to educational broadcasting. We invite and urge social scientists to consider educational broadcasting seriously when selecting new research projects. The frames of reference and the approach as well as the techniques and methodology from each of the behavioral sciences can play a constructive part in the total research program. At the same time the added insights and knowledge of communication and learning processes should contribute to the several disciplines.

In this report we classify the problems of research in educational broadcasting under three categories:

1. the media and messages of educational broadcasting
2. the audiences of educational broadcasting
3. the effects of educational broadcasting.

The selection of these three categories has limitations and advantages. It imposes certain assumptions and limitations upon thinking. Possible fruitful lines of research may not be thought of by people working in the context of such categories. It will be less easy to think clearly about fundamental similarities among things that fall in different categories. It will be less easy to think clearly about fundamental differences among things that fall in the same category. The principal advantage is that the chaotic conglomeration of unrelated items is avoided by separating the material into categories, however painful this may be in the inevitable borderline cases that appear to fall equally well into more than one category, or perhaps equally poorly in all.

As an antidote to the possible ill effects of our categorization system, it seems desirable to consider a more elaborate system which may reveal some of the reasons why certain research topics are hard to fit into the three currently proposed content areas. (See Figure I on next page.)

We are dealing with two groups of individuals: those behind

the broadcasting medium (behind the station transmitter, etc.), and those in front of it. The distinction here is between the broadcasters and the audience. Each of these groups has things (stimuli, if you wish) acting on it, and consequently effects occurring in it (responses, if you wish).

The individuals behind the broadcasting medium affect each other. There is a little feedback loop here. They put material into the educational broadcasting medium. They are affected by educational broadcasting that they observe. This is a slightly larger feedback loop. The broadcast material reaches the audience. The audience interacts with itself: another little feedback loop. Or the audience sends information and response back to the broadcasters: a larger feedback loop. Furthermore, the broadcasters reach

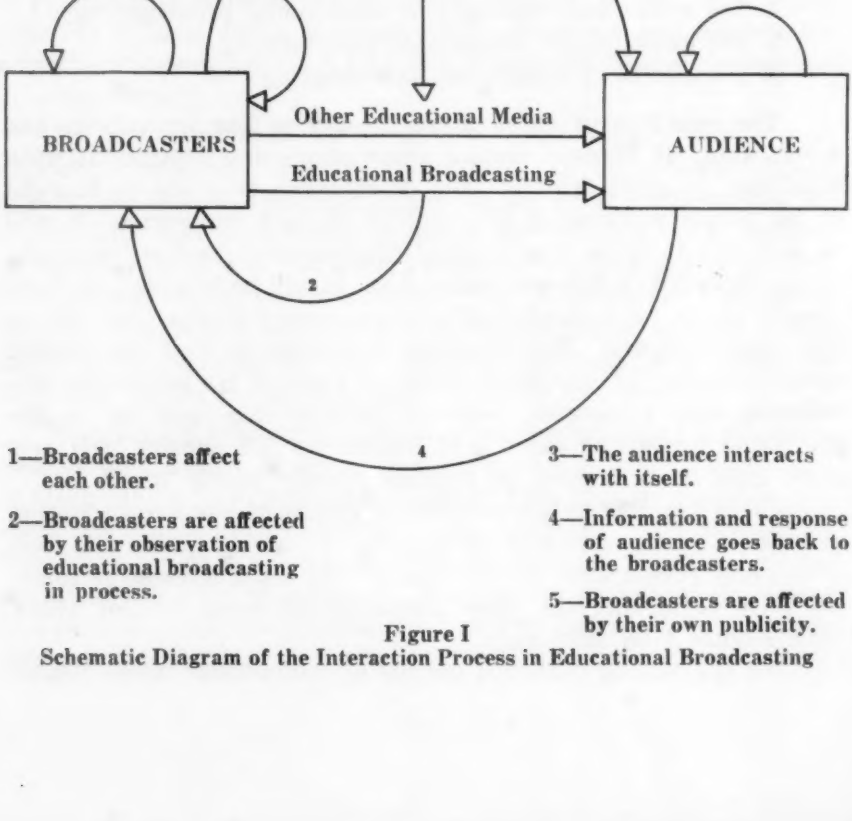

Figure I
Schematic Diagram of the Interaction Process in Educational Broadcasting

the audience by noneducational channels (e.g., publicity handouts). Some of this affects the broadcasters themselves: a small feedback loop. Reseach of the kind we have been discussing consists of reaching into this system of group interactions somewhere or other, and taking measurements. If the research is normative or simply basic fact-gathering, then usually the measurements will be taken at just one place (for example, the costs at the broadcasting end). If the research is correlational, or somewhat more "experimental," we take measurements at two or more places in the interaction process, and compare the results of the different measurements. For example, the purposes of the broadcaster may be compared to the effects on the audience, or the feedback of the audience may be compared to the changes they produce in the broadcasts.

When measurements are made at more than one place, then it becomes difficult to see in which one of our three categories (media, audience, effects) the research goes, because the measurements may refer to things that fall in different categories.

In addition we are concerned with time variables, such as long-term and short-term effects. These questions are also hard to assign to our category system.

This report deliberately makes no endorsement of a particular social science approach, a particular model, or a particular kind of methodology. On the contrary, we agree that the interrelationships between messages, audiences, and effects are best understood as part of a process, with interaction taking place constantly within that process. It is sometimes helpful to think of these variables as having a circular arrangement. Within the circle, one may discover certain clusters of elements which attract the attention of the researcher. It is thus possible to enter the circle at a point where one may talk about effects, or at another point where one may talk about the message. However, despite this terminology, once outside the circle, the design of the research must consider or hold constant or account for all that lies within.

STUDIES OF MEDIA AND MESSAGES

Continuing Problems

The Seminar agrees that significant problem areas calling for research in educational broadcasting exist within a cluster of elements referred to as "the media and the messages" to be transmitted. Within the term media may be found problems dealing

with control and support, problems of unique characteristics, and problems of availability.

Control and Support. For the past two decades one of the critical areas of study has been the tracing of relationships between the formal structure of an educational broadcasting organization and its associated organizations and agencies in terms of financial support, extent of control, and the relationship to various community goals. The comparatively recent development of educational television and the changing situation within the American community call for continuing such investigations.

The researcher who proposes to examine such relationships finds a surprising variety of organizations, institutions, and agencies related to educational broadcasting. Not only do they vary in size when radio is compared to television, but within both media, organizations vary according to the audience served, the goals to be achieved, and even by chance. Those organizations devoted to communication with specific controlled audiences (as in classroom broadcasting and home study courses broadcast for credit) are supported by school systems or colleges and universities. In turn, these educational institutions have been given some financial support by foundations and funds. Organizations chiefly devoted to adult education broadcasting are supported typically by voluntary contributions, by public school systems, by colleges and universities, or by direct action of state legislatures. Some observers suggest that the source of financial support is the chief determinant of message and audience. Among other approaches, a study of the image of each type of broadcast organization held by its respective audiences would serve, among other purposes, to throw some light upon the validity of this hypothesis.

Unique Characteristics of the Media. One of the challenging areas of research lies in the similarities and differences among the stimuli of the broadcast media of radio and television and the audio-only and TV closed-circuit distribution systems. Radio research studies long completed need to be sought out, winnowed, and carefully re-examined before new projects are undertaken. Indicative of the pressing problems in this area is investigation of the type of message most suitable to a particular channel of communication. A school system broadcasting both radio and television into classrooms should use each for what? From a practical point of view, the success of broadcasts by television to classrooms has

resulted in at least one organization's attempting to obtain radio channels to bear part of the indicated future load of educational broadcasting. Major contributions by radio to education may well lie in the future.

Availability. Educational broadcasting can take place only when facilities are available for use by educators to reach target audiences. Such facilities include (a) channels made available by the Federal Communications Commission, including those designated specifically for educational broadcasting in FM radio and television; (b) actual transmitting facilities (open or closed circuit), including use of commercial stations within reach geographically and financially of the educators; (c) signals capable of being received by target audiences; and (d) receiving equipment, both plentiful and convenient, among the intended audience. Each of the above factors suggests a host of problems which must be examined periodically. For example, the first factor suggests studies of the adequacy of channels in terms of populations, educational program resources, and area needs. The second factor suggests studies of station locations in relation to educational needs, as well as relative equipment costs of various modes of transmitting signals. The third factor includes coverage studies in relation to audiences, and the fourth factor involves research in the relationship of UHF or FM and audience availability.

The Seminar also distinguishes a series of problems relating to "the messages" of educational broadcasting. We report in all candor that continuing research must be concerned with increasing the effectiveness of the educational broadcast message. No single study can solve such a problem permanently. Changes in areas of concern and changes in the audience will have to be met with continuing efforts to establish and maintain effective communication. We suggest three areas: research concerned with content, with program presenters, and with style and form.

Content. How relevant to contemporary needs, situations, and problems is the content of today's educational radio and television programs? To appraise relevancy on the basis purely of obvious labels and intent is in itself a huge task in terms of the tremendous output of broadcast stations. To judge relevancy by an analysis of the actual messages being transmitted is an even more difficult assignment. Yet much research and many judgments and decisions are dependent upon knowing what is being said to children by

school broadcasts and to the man in the street by the some 35 educational television stations and 150 educational radio stations. What is said over these stations concerning significant local, regional, and national issues? What is being reported and interpreted regarding events connected with recurring international crises? How does this content differ from that of commercial broadcasting, of other educational and informational media?

At the present time no one is able to answer these questions. Studies of educational broadcast content in relationship to a host of other factors represent a challenging and significant area of research beset with vexing problems of sampling, content-appraisal, and general methodology.

Program Presenters. A research breakthrough is needed in the area of educational program talent. Not enough is known about the person who presents the message by audio or audio-visual means. This is not to say that such questions as "What are the factors characterizing a successful performer?" or "What traits distinguish the good television teacher?" have not been asked repeatedly. This area is strewn with remains of 20 years of relatively unsuccessful studies. Examination of these sincere attempts should help today's researcher to profit from this past experience. It is reasonable for an administrator to seek the guidance of research in the selection of personnel qualified to present educational programs. When a manufacturing corporation spends tens of thousands of dollars pretesting a particular individual for his suitability as host or master of ceremonies for a television drama series and succeeds in identifying an excellently qualified person, we must applaud this success. Research in the suitability of educational broadcast performers is at least equally necessary and probably more difficult.

Style and Form. Substantial research is needed if there is to be knowledge of how the message of the educational broadcaster can be most effective. Work upon the problem of analyzing style and form must proceed on several levels. The communicator directing programs to specific classrooms and individuals finds his most acute difficulty in terms of the style and form of the single program and the relation of that program to the series of which it is a part. Some success has already been achieved within this framework. On the broadcast level, we see far less success. Those familiar with research in total program output recognize that there are certain

patterns which operate for maximum effectiveness. In recent years, the commercial industry has experimented with large time segments devoted to programs of similar nature or mood which has been termed "block" or "mood" programming. Little information is available concerning the effectiveness of such program patterning, particularly as to applicability to educational stations. At present, there do not even exist generally accepted hypotheses regarding an educational station's total program output which can be put to some objective test.

Immediate Problems

The Seminar agrees that within the general areas of continuing research outlined above, three problems appear to demand immediate attention: finance, program effectiveness, and feedback. Operators of educational broadcasting installations present at the Seminar stated the case most forcefully for the need for research in these three areas.

Finance. Educa onal broadcasting appears to be reaching a temporary breathing period after its vigorous efforts to activate 35 educational television broadcasting stations and numerous closed-circuit installations. For many, the financial problems of capital outlay are being replaced by problems of operating expense. In many of the stations, original objectives have been greatly modified or scaled down to adapt to a rapidly changing financial structure.

There appears to be little, if any, exaggeration in the statement that the problems of financing the operation of educational television during the next year or two are crucial. These difficulties affect educational radio as well, for in some organizations the vast expense of television operation has resulted in suggested or actual cutbacks in educational radio budgets.

Many normative data on support are lacking. Information on operating costs for each type of station (nonprofit corporation, university-operated, et cetera) is urgently needed as a basis for future planning. It is not generally known that some elements of noncommercial educational broadcast operation may be subject to federal taxation. An immediate thorough examination of this problem is called for. The range of staff salaries and faculty remuneration, including "residual rights" for control of kinescope distribution is another problem needing study.

Beyond the accumulation of normative data lie the other problems of community support. Is the total community adequately served, or are large segments of the public indifferent to, unsatisfied with, or resentful of educational broadcasting? Does financial support come from those being served? From the point of view of continuing operation, should it? What methods of cooperation exist between community organizations and the broadcast stations, and how satisfactory are these methods?

Program Effectiveness. It is symptomatic of the increased maturity of educational broadcasters that there is a growing interest in the actual results of programs. The worthwhileness of stations is quite apt to be judged in terms of what appears to be accomplished by broadcasts. Such assessments will be made by controlling boards and by the public whether or not pertinent data are available. The operators of educational broadcast installations are to be congratulated upon their interest in initiating efforts in objective evaluation.

Many day-to-day decisions of the educational broadcaster are influenced by available data on program effectiveness. He is constantly forced to decide which particular program shall have access to the air, from among several alternatives. The cost of broadcast facilities and operation both to selected groups and to general audiences is such that in some cases both significance and potential audience size would suggest that it might be more economical and equally effective to hire a hall and send out printed invitations.

On the other hand, there are small audiences, such as the illiterate adults in Memphis (and many other cities) where only broadcasting appears to meet the needs of the situation. The objective is so significant, the convenience for viewers so determining, and the saving in teacher time and energy so important, as to overcome objections based only upon the fact of small audiences. The broadcaster is happy to allocate his facilities to serve such small numbers, provided he has evidence of the effectiveness of the operation.

It is clear that while the absolute minimum level of audience information required by the broadcaster consists of coverage data and program ratings, in most cases he requires far more information to gauge program effectiveness, whether with small or large audiences. Nevertheless he might make far more use of

program ratings than he now does. In many cases such data are available to competent educational researchers if efforts are made to obtain them. They should be procured, analyzed, and disseminated immediately among educational broadcasters. The major attention of researchers concerned with program effectiveness should, of course, extend far beyond audience size in itself.

The Seminar agrees that investigation of particularly effective educational broadcast programs may prove fruitful. Identification of factors related to success in such instances should have wider application. A number of studies of the failures of educational radio broadcasting in the past have proved to be relatively sterile. Perhaps a comparison of successful and unsuccessful efforts may help to identify factors associated with success.

Feedback. Implicit in the above problems is the importance of the provision for systematic (rather than accidental) feedback from the audience and possibly from supporting organizations, with respect to broadcast activities. Therefore, efficient and economical ways of securing feedback, including both suggestions from audiences and records of response to broadcasts, need development as a part of essential methodology. Relationships of feedback to program change and program effectiveness constitute an urgent area of study.

STUDIES OF AUDIENCE

It has been said that we live in a communications revolution. We must comprehend its dynamics if we are to understand the audience of educational broadcasting.

Based on Social Change

We have moved from the period when education was limited to small elite groups to the present period when education is demanded for great masses of people. However, in a great many instances, social change has exceeded the capabilities of the members of the society to cope and exist with these changes. In addition, the change in orientation toward education has meant that the educators themselves lag in methods of handling the problem of rapid mass education.

One of the effects of the communication revolution is the increased speed with which information can be disseminated. This rapid and widespread dissemination creates an acute awareness of social changes taking place. This awareness reveals to the

audience many "underdeveloped countries in their minds." The educational broadcaster is responsible not only to create awareness of ongoing change but is also one of society's agents responsible for fulfilling the educational needs aroused in audiences by this awareness.

As a general approach to the problem of educational audiences, we believe that it is necessary to pinpoint the pressures and stress points which exist in human life. These stress points, the "underdeveloped countries of the mind," reveal the gap people feel between their present attainment and self-image, and the world in which they find themselves. There is a feeling that they *ought* to sharpen up these areas. Voluntary interest can be tapped. Research is required to identify these areas.

Such problems, as well as that of using educational broadcasting to help alleviate the pressures, are not new ones. At one time, proponents of educational radio grappled with these problems and suggested appropriate procedures. We recommend as an immediate step that we take an analytical look at the history of educational radio. Many of the pioneers of that movement are still with us. The ideas for television audience research which are developed by this Seminar should be "pretested" by finding out what educational radio pioneers did in various areas.

Based on Areas of Need

Basic research on audience, we feel, is the discovery and definition of areas of need. Our principal population for study should be the *potential* audience of educational broadcasting rather than those presently reached.

The "audience needs" orientation involves felt needs, potentially felt needs, and even some unfelt needs. Felt needs are areas in which audience members consciously want programs, and are motivated enough so that they will tune in to them. Potentially felt needs are areas in which audience members will rather quickly realize an interest, once the area is pointed out to them. Unfelt needs are areas which would be identified by serious students of society as representing actual and significant needs, but in which people appear to have no interest. The burden of proof is on the educational broadcaster to show that unfelt needs can or should be treated in any but a "captive" audience situation.

A substantial portion of educational broadcasting should be based upon servicing the *felt* educational needs of the populace.

If such felt needs could be identified through research, then the whole educational broadcasting movement would have one firm basis upon which to ask the community to support relatively expensive educational broadcasting stations.

Felt needs and potentially felt needs would often be turned up by exploring pressure and stress points in our culture, where one aspect of life has pulled away from other aspects.

For example: The illiterate makes a good dollar wage, has a middle class home, but feels the gap between his illiteracy and the remainder of his way of life. Lower middle class children who grow up to upper middle class incomes want to belong, and to shed the stigmas of their origins. They feel the need for learning many kinds of things that legitimize their higher status. Regardless of socioeconomic status, many people feel that they are falling behind in even a speaking acquaintance with progress in the most swiftly moving areas such as electronics, medicine, and so on.

We are stressing that the educational broadcasting audience exists in a total social field. The activities of production and consumption in the educational area are no longer isolated and confined to a process in which the teacher passes along knowledge which he happens to have or of which he approves to a captive consumer. The teacher must now consider his audience as part of the entire community of learning, and not as a mere isolated target for the sort of ammunition he happens to have in stock.

An example of what research on the *potential* audience may turn up may be illustrated in this manner. We may seek from a potential audience their notions of *ideal* educational goals. If we dig a little deeper we may find that the expressed ideal goals are perceived by the respondents as beyond immediate attainment. This would suggest that some of the difficulties in educational broadcasting may be due to the acceptance of expressed *ideal* goals as *workable* goals in programming.

Inquiring further of our respondents, we may find their actual educational attainment for various segments and subsegments of the potential audience. This will reveal quite clearly one type of gap, that between ideal goals which they have expressed and the actual educational level which they have attained.

There is an additional type of information which can be gathered. These are *realizable* goals as perceived by the respondents. We inquire as to the possible stage, state, or status which they realistically judge to be attainable within the time, money, and

energy which they can spare. This level will never be the same as their actual attainment but, likewise, will never be at the level of ideal goals. Here is a second gap. Perhaps it is in the area of this gap between realizable and presently attained goals that educational broadcasting should concentrate.

At the same time that we seek to delve into the needs of the potential audience, we should make every effort to interest social scientists in including studies of the status of educational broadcasting as part of larger studies dealing with the web of social interrelationships. For example, educational broadcasting seems to have cast the educator in a new role not only of writing the text materials but also of publishing the text and disseminating it. As new functions are acquired by educators, they are forced to cope with change just as they must educate others similarly to take change into account.

Approaches to Actual Audiences

Once basic needs are established through research on the *potential* audience we can turn to questions about approaches to *actual* audiences. A natural division in educational broadcasting (especially television) seems to be between two types of audiences —captive and free. There is a parallel division in points of view and the kinds of questions posed in audience research.

In the *captive* audience situation we are concerned primarily with teaching more efficiently what *must* and *should* be taught. In the *free* audience situation, we are more interested in teaching things in such attractive fashion that large audiences will be attracted to voluntary learning. The acceptance or rejection of an educational broadcast by the free audience is one of the basic criteria for assessing the value of the program. What educators *want* to teach must be harmonized with what a reasonable minority of the population *wants to know.*

Having these two dissimilar orientations poses the initial problem of how the educational station can project an unambiguous image. The subsequent research follow-up will be concerned with whether the station has been successful in doing so.

Other problems which we can list for research can be grouped under the two divisions of captive and free audience conditions.

For Captive Audiences. What recognized educational needs exist for which insufficient teachers are available, for example in

specialized fields such as art, science, music, or foreign languages? To what extent can these needs be met by instructional radio or television? What educational needs exist in this fast-moving world because teachers in a particular locale are not able to keep up with new developments in their fields? To what extent can these needs be met by radio or television? What parts, segments, or lessons within courses lend themselves to lecture-demonstration so as to free teachers for handling more individualized instruction? What validity has the "master teacher" concept in radio and television in terms of meeting the needs both of students and of their more pedestrian teachers? How do students respond to the television teacher as contrasted with the live teacher? How do they conceive their roles in connection with television teaching?

For Free Audiences. What is the hierarchy of audience values? What is the nature of the social situation in which educational broadcasting operates? What kinds of competitive demands are placed on audience members? What model of the free as opposed to the captive audience is a realistic one?

Although we have not spelled out the usual questions in audience analysis, we must not overlook these. Demographic data for descriptive purposes must be obtained. Such data are available at minimal or no cost in some areas. We recommend that a governmental agency, such as the United States Office of Education, be urged to conduct periodic surveys to supply other basic audience data. Even such basic things as availability of sets in the audience (especially availability in schools, colleges, and universities) are not known. The number of UHF conversions for those areas in which an educational television station is the only UHF station might be sought. Perhaps a biennial census of data important for educational broadcasting could be established.

STUDIES OF EFFECTS

As we consider the effects of broadcasting we must keep constantly in mind the fact that we are concerned with much more than the one-way effects of educational broadcasting. Instead, we reflect a concern for all broadcasting and all segments of the culture affected. We recognize that effects can proceed in more than one direction; for example, that reactions of recipients may produce effects upon those responsible for the message. Producers, administrators, performers, nonperforming school staff, users and nonusers—all may be influenced.

Many, if not all, effects can be observed on an immediate as well as a long-term basis. Typically, formal education is more concerned with long-term effects, and this should be considered in appraising results in this area. On the other hand, other broadcasting ventures may be adequately evaluated in terms of their immediate impact.

Similarly we recognize that we must concern ourselves not only with averages and the normal individual; the deviant individual can be a source of productive information and hypotheses, also.

There is a very real danger of considering only those effects which correspond to the intentions of the broadcaster. There exists a broad range of incidental effects which will merit investigation. When such incidental effects are perceived or can be anticipated, research people should seek to identify and interpret them.

We are offering two related analyses here. First, we analyze the effects to be examined. Next, we consider the individuals and groups to be affected.

The Effects

The effects of educational broadcasting are presented under the following categories: action, psychomotor skills, involvement, cognitive behavior, affective behavior, and ancillary effects.

Action. Educational broadcasters are sometimes interested in action per se. We sometimes want to get out the vote, to get people to attend concerts, or to brush their teeth. Action is relatively simple to measure since it is a matter of direct observation rather than inference, and the behavior has its own validity. It is important to note, however, that this type of research, taken alone, does not contribute a great deal to our level of understanding of the media or of the people and institutions with which they interact. We hope that research projects which are concerned with action will try to go deeper, to use action as an index of such types of effects as are noted below.

Psychomotor Skills. Such skills as typing, knot-tying, and laboratory manipulation would be included in this category. Again, such skills would be appraised by direct observation methods and examination of products.

Involvement. This is a problem which concerns any broadcaster. Broadcasting can obviously have no effect if viewers or

listeners are not tuned in, physically or mentally. Involvement can probably be broken down into these two categories:

1. *Physical presence.* This aspect of involvement is concerned with the number of recipients of the message being broadcast. Analyses in this area are usually based upon numerical indices derived from enumeration data. Merely the fact that a set is turned on in the home is generally assumed to indicate at least a minimum of emotional and/or intellectual involvement. Preceding most of such research an attempt should be made to define indices for educational broadcast audiences different from those currently used with commercial broadcast audiences. Such indices might be termed "indices of expectancy" and be based upon the particular fraction of the audience in which we are interested—the expected audience—rather than upon the usual total number of sets in an area or the "sets in use." We need to study the effects of different types of promotion upon the desired audience for an educational broadcast. We need to ask not only "how many" but "why," and "how," and "how well?"

2. *Attentiveness.* This might be the best term to use for our second category of involvement. It includes all degrees of attentiveness from bare "marginal listening" to rapt attention. It is possible that kinds as well as degrees of attentiveness can be distinguished. Meaningful indices for attentive behavior need to be developed relating to degree or kind or number involved. An approach might be through the rating of directly observed behavior as "relevant" or "irrelevant." Another approach might involve stopping the program at some point and simply asking subjects what was going on. A third approach might consist of measuring the subject's degree of participation in the broadcast, relating this, of course, to the appropriate behavior in relation to the broadcast. Through the use of such indices, we may study the content, performance, production, and audience (individual) variables which influence attentiveness.

Cognitive Behavior. This category includes such effects as (a) levels of information (from facts to concepts and understanding), (b) skills in self-directed learning, (c) problem-solving ability, and (d) critical thinking ability. In studies to determine modifications brought about by broadcasting we need to study

individuals and *subgroups* as well as major groups. It is important to examine transfer or generalizing of this type of learning. We can continue to use the usual achievement tests but we could gain greater understanding of cognitive effects from item analyses of data. We need to develop new and different kinds of diagnostic, achievement, problem-solving, and critical-thinking tests so that we can better evaluate our educational broadcasting efforts. We can examine incidental behavior (that is to say, behavior which is not the direct result of the broadcaster's or researcher's telling the subject to do this specific thing) as an index of some aspects of cognitive effect. Some examples are subsequent ability of subjects to select "good" books from the library, to organize materials in written form.

Affective Behavior. This category includes such elements as (a) attitudes, (b) self-concepts, (c) interests, (d) stereotypes, (e) adjustments, (f) appreciations, including discriminations, (g) sensitivities, and (h) values. Though these aspects of behavior appear to be of major concern to the educational broadcaster, they have received as yet little consideration in broadcast research. There are a number of instruments available for evaluating these types of effect. These include depth or focused interviews, projective techniques, the Semantic Differential, attitude scales, the Q-technique, interest inventories, values inventories, and personality inventories. Many additional techniques for evaluating affective behavior need to be developed. It should be noted that in probably no other area is it as vital that the researcher be well trained.

The Affected

We recognize that it is impossible ever to separate the person from the society in which he lives. It is this society which has supplied him with his values and patterns of action. Hence it is apparent that an individualistic approach alone is not sufficiently broad if we are to understand the educational broadcast process. It may be profitable to look at effects of educational broadcasting from four points of view as indicated in the diagram below.

The individual might be seen as the person who just happened to tune in, or who tunes in for strictly personal reasons

which are connected only minimally with institution or group membership.

The interest group would be composed of those special-target groups united because of the particular effect they hope to secure from the message. Examples of such groups are a class in school, presumed to be united in an interest in learning subject matter; or a parent-education study group interested in learning more about child behavior.

Institutional groups pre-exist in terms of affiliation with some institution, e.g., the employees of a corporation or members of a religious body.

Finally, there is the total society, sometimes appealed to directly, as in an address by the President of the United States; more often appealed to indirectly through interest groups, institutions, or persons. Our society has become so complex that direct appeals tend to give way to the indirect. It should always be kept in mind that persons, interest groups, institutions, and society are always in interaction, each with the other. Hence any effect on one will also affect the others. It might be noted that in a more restricted, but quite realistic sense, the "total society" for most educational broadcasters is defined by the coverage of his station. The characteristics of this "universe" are of basic importance in setting research targets.

It would be interesting and it might be worthwhile to do incisive research designed to discover whether those recognized and tested methods of producing effects in persons may also be applied to interest groups, institutions, and society as a whole. Further leads for such research might well come from the work on groups such as that done by Robert Bales or on social systems by Talcott Parsons.

General approaches to the identification and measurement of effects involving groups, institutions, and society involve the same variables of action, involvement, cognitive and affective behavior as relate to the individual. However, when the frame of reference is shifted from the study of individual effects to the study of group or societal effects, the sampling unit must be redefined. The sampling theory applicable to these problems has been under study for several years and the problems are generally recognized as complex. We shall not explore such problems here, but rather we shall refer the reader to the treatment of these topics in standard references in this field.

Immediate Problems

Research involving affective behavior, critical thinking, and problem-solving aspects of cognitive behavior probably would make the greatest contribution at this time to our understanding and more effective use of the educational broadcast media. The cost of such studies and whether they should be done at the local or national level will depend primarily upon the independent variables which are to be examined in relation to effect. The Seminar believes that greater emphasis should be placed upon research dealing with group and institutional effects of educational broadcasting.

NEEDS IN EDUCATIONAL BROADCAST RESEARCH

From the beginning this Seminar recognized a number of important needs relating to educational radio-television research. During the course of the meeting, systematic probing into the broad field of educational radio and television research was constantly accompanied by analysis and re-evaluation of needs and objectives.

From the viewpoint of this Seminar, the outstanding needs in the area of educational radio-television research might be expressed as follows:

1. The need to focus attention on the importance of a cooperative and coordinated approach to the problems of educational radio-television research.
2. The need to focus upon the problems of educational radio-television research, the ideas and the thinking of the many people from varied disciplines whose contributions could aid in this work.
3. The need for continuing effort to define and re-evaluate the problems and objectives of educational radio-television research.
4. The need to formulate, implement, and execute a broad plan of attack on the problems of educational radio-television research.
5. The need to raise the status of educational radio-television research through better public understanding of its aims and results and through the involvement of increasing numbers of qualified researchers.
6. The need for financial support of both broadly based and locally centered research projects.
7. The need for better dissemination of accurate information concerning the activities and results of educational radio-television research.

8. The need to develop and stimulate adherence to suitable standards for educational radio-television research.

RECOMMENDATIONS*

This Seminar was cognizant of grave responsibilities which rest on education today and loom on the horizon of the future. In a practical sense the measure of problems confronting education is a measure of the tasks to be accomplished by communication. In the educational job ahead, radio and television have significant responsibilities and untold potential. We believe that broadcasting research should be brought to bear in every possible way on the problems of education and on the job of achieving popular comprehension of the condition and needs of our society and of the urgency for immediate action.

Each educational station or programming agency should use the services of trained research personnel. We feel that this is necessary if radio and television are to operate responsibly for education. Additionally, and regardless of the limitations of its resources, each station or programming agency should designate an individual to be responsible for the research interests of the organization. As a means of maximizing the total research potential, each station or programming agency should be encouraged to develop a clear statement of its goals and major purposes. Those engaged in research** in this significant field should adhere to the highest standards of both social responsibility and research technique. Continuous development of such standards should be encouraged in all appropriate ways.

* The original Seminar report listed several specific recommendations. However, many of these pertained specifically to NAEB activities and have been eliminated from the general summary of recommendations given here.

**Special resource persons, including a number of outstanding research workers in education and communications, assisted in the searching appraisal and preparation of this research program. The resource group was comprised of Benjamin S. Bloom, University Examiner, University of Chicago; Reuel Denney, Professor of Social Sciences, Center for the Study of Leisure, University of Chicago; Burleigh B. Gardner, Executive Director, Social Research, Incorporated; Herta Herzog, Vice-President, McCann-Erickson, Incorporated; Paul F. Lazarsfeld, Chairman, Department of Sociology, Columbia University; William J. Millard, Jr., Director, Millard Research Associates; Theodore M. Newcomb, Chairman, Doctoral Program in Social Psychology, University of Michigan; John J. Scanlon, Deputy Director of Research, Fund for the Advancement of Education; Harry J. Skornia, Executive Director, National Association of Educational Broadcasters; Ralph W. Tyler, Director, Center for Advanced Study in the Behavioral Sciences; Gerhart D. Wiebe, Partner, Elmo Roper and Associates; and from The Ohio State University: Vice-President Frederic Heimberger, Instruction and Research; John Bennett, Professor of Sociology and Anthropology; Edgar Dale, Professor of Educational Research; George A. Kelley, Professor of Psychology; Franklin H. Knower, Chairman, Interdepartmental Committee on Communication Research; Richard Mall, Associate Professor of Speech; Frank R. Peters, Director, Measurements and Evaluation, University Counseling and Testing Center; Alvin Scodel, Associate Professor of Psychology; Harrison B. Summers, Professor of Speech; Paul Wagner, Associate Professor of Journalism; and Lauren Wispe, Associate Professor of Psychology. I. Keith Tyler, Professor of Educational Research and Director of Radio-Television Education, and a member of the NAEB Research Committee, directed the Seminar. Richard Hull, Director of Radio-Television Broadcasting, served as Seminar Leader.

This Seminar* means to encourage such organization of research efforts as will serve most effectively in dealing with the critical problems of our times. Problems and issues must be identified, defined, and evaluated in terms of their relative importance. We advocate focusing upon the problems of educational broadcasting all the resources of content, intellect, and methodology available in our various organizations.

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* *Seminar Participants:* Gale Adkins, Director, Office of Radio-TV Research, University of Kansas; Sam L. Becker, Director, Division of Television-Radio-Film, State University of Iowa; Raymond D. Cheydleur, Chairman, Department of Speech, Manatee College, Bradenton, Florida; Ryland W. Crary, Director of Education, Educational Television and Radio Center; John B. Ellery, Supervisor, Radio and Television Research, Wayne State University; Clarence E. Flick, San Jose State College, California; A. W. Foshay, Executive Officer, Horace Mann-Lincoln Institute of School Experimentation, Teachers College, Columbia University; Herbert Gerjuoy, Associate Professor, Department of Psychology, The University of Toledo; Kenneth Harwood, Chairman, Department of Telecommunications, University of Southern California; Earl G. Herminghaus, Research Consultant, St. Louis Public Schools; Hideya Kumata, Associate Professor, Communications Research Center, Michigan State University; Chalmers Marquis, Director of Program Development, Chicago Educational Television Association; Marshall McLuhan, Chairman, Culture and Communications Seminar, University of Toronto; Irving R. Merrill, Director, Television Research, Michigan State University; Harry E. Moore, Department of Sociology, University of Texas; Charles O. Neidt, Chairman, Department of Educational Psychology and Measurements, University of Nebraska; John Parsey, National Project in Agricultural Communications, Michigan State University; Howard Rowland, Associate Professor of Sociology and Director, WQED Audience Research Project, University of Pittsburgh; Warren F. Seibert, Television Program Research Consultant, Purdue University; John R. Shepherd, Assistant Professor of Speech and Coordinator of University of Oregon Productions on KOAC-TV, University of Oregon; Laurence Siegel, Assistant Director, Experimental Studies in Instructional Procedures, Miami University, Oxford, Ohio; Frank Sloane, Director, Board of Public Instruction, Dade County (Miami), Florida; Percy H. Tannenbaum, Assistant Professor, Institute of Communications Research, University of Illinois.

BOOK REVIEWS

CARPENTER, C. R.; GREENHILL, L. P.; and OTHERS. *An Investigation of Closed-Circuit Television for Teaching University Courses.* Instructional Television Research Report No. 2. University Park, Pa.: The Pennsylvania State University, Spring 1958. 110 p.

Reviewed by

• CHARLES F. HOBAN

This is the second report on the use of closed-circuit television in university instruction at Pennsylvania State University. It covers research conducted during the academic years 1955-56 and 1956-57. The project has been sponsored by the Fund for the Advancement of Education.

The report is a rich mine of information—quantitative, observational, evaluative, and orientational. In number of experiments reported, kinds of data collected and analyzed, and range of important areas investigated, the report is the most comprehensive this reviewer has yet encountered in the growing field of research in the educational use of television. It is authored by C. R. Carpenter and L. P. Greenhill in collaboration with W. F. Christoffers, F. R. Hartman, J. D. Hundleby, L. F. Kepler, J. A. Murnin, H. C. Peters, W. S. Ray, H. D. Sherk, and L. E. Stover.

The honesty, thoroughness, and scholarly detachment one learns to expect from research reports in the use of newer media originating in Penn State's Division of Academic Research and its predecessors is also apparent in this report.

Four problem areas were investigated: comparative effectiveness of TV and face-to-face instruction; appropriateness of

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closed-circuit television in the sense of adaptability and adaptations made in its use; acceptance of TV instruction by faculty, students, and administration; and feasibility in terms of equipment, personnel, and cost of teaching by closed-circuit television in contrast to conventional methods of instruction.

Within the limits of implementation and instrumentation of this research in university instruction, results of comparisons of TV versus face-to-face instruction should go a long way toward laying this tired problem to well-deserved rest. The number of experimental replications and the variety of courses sampled are impressive.

The usual results of comparative effectiveness studies in ETV are reported—no significant differences associated with either method. An optimist may generalize the reported findings to mean that TV instruction in the University is as good as face-to-face instruction. A cynic may generalize them to mean that the results of University teaching by TV are not measurably worse than those obtained in the "togetherness" of face-to-face teaching.

Unquestionably, the problem of comparative effectiveness of TV instruction needs looking into, but not prolonged, expensive, and time-consuming research once there is reasonably sound indication that no significant loss has been experimentally detected from TV instruction. There is little question that the Penn State researchers would agree with this point of view. Your reviewer believes that much research effort has been wasted on this problem and that the requirement that it be investigated in infinite time derives from a false image of university instruction. This image involves the homogenization of a variety of factors under the catchy and wistful slogan of "face-to-face teaching." Speculative analysis would indicate that the values of face-to-face teaching depend at least on (a) the warmth of the instructor toward people, including students; (b) the stature of the teacher as a person and as a scholar; and (c) the opportunities for teacher-student interaction, which, in turn, depend on class size and committed time of the instructor. Wash out these factors, and you are left with the independent variables of representation and the thing represented.

It is to be hoped that the impressive array of comparative effectiveness data in this report will bury the problem under an earthy crust of solid granite. Even then, you can be sure that

some eager busybody will invent an atomic drill and tap the problem the hard way.

As far as a university faculty is concerned, the reported findings *(ad nauseam)* on comparative effectiveness *should* be decisive. If research results were unique determinants of decisions on teaching methods of college and university instructors, these teachers would henceforth enthusiastically welcome closed-circuit TV with open arms. In all probability, they will do no such thing.

College and university teachers are a breed unto themselves, unique among professional groups in that they not only receive no systematic and critical training in the methods and techniques of their profession (teaching), but steadfastly resist the very thought that they should. For all the emphasis among intellectuals on rationality, the human beings who teach in colleges and universities are not entirely rational in their attitudes toward their own activities. All in all, it is a very good thing that they aren't. Too often the "rationalists," notably the empirical scientists, have had their last word to say on their subject, only to eat crow the next day.

But henceforth, university teachers may find it a trifle more difficult to maintain a completely closed mind toward the use of modern technology in teaching—in a remotely abstract sort of way, of course.

The sensitive reader can find at least two telling reasons why the problem of television teaching in college and university (and elsewhere, for that matter) is likely to be viewed in the remote abstract. It is reported that of the 15 college teachers participating in these TV experiments at Penn State, 80 percent anticipate that their work for TV courses would be *harder* if they were to achieve the same results they now get in non-TV teaching. Teachers without experience in TV teaching also share this opinion, but the percentage so reacting is approximately 65 in contrast to 80. This poll of public opinion among the profession suggests that TV teaching may be even harder than the uninitiated estimate.

A second reason is that some of the University teachers "did not make the grade over television. . . . For these instructors television seemed to accentuate limitations of teaching skills and abilities. Thus, they did not long survive the rigors of instructional television."

It must be emphasized at this point that other teachers did survive the exacting demands of this medium, that they were

highly motivated and intensely involved in the attempt to improve their teaching "in the interest of students in the face of increasing enrollments," and that they "not only accepted television but they also accepted the rigorous demands of experimentation in their courses."

This is something worth noting—the devotion of college teachers to their teaching mission and their ability to subject themselves to stern tests of adaptation and performance. There is little rationality in devotion. Mostly love.

Between 1955-56 and 1956-57, there seemed to be a negative drift among the Penn State faculty questioned on their estimate of the way other faculty members felt toward TV instruction. On the other hand, there seemed to be a positive drift of faculty reaction toward expanding television teaching to some degree. This ambivalence is possibly a function of the questions asked, but it is also possible that the ambivalence is real as well as apparent.

Student reaction data are presented on various factors, such as traditional or adapted TV instruction, large and small receiving rooms, variation of instructional routines in the experiments, courses taught, and so on. In general, student attitudes toward TV instruction increased positively between the mid-term and the end-term measurements. The most interesting and perhaps significant observation of student attitude toward instruction by TV or without it is that the hour at which a course is scheduled is more important than how the course is to be taught.

From the report of reactions of the administration and the trustees toward TV instruction, it is apparent that they were favorable in disposition. A weather eye was peeled for adverse reactions from parents and other influential adults. People don't take kindly to radical innovations in the education of sons or daughters of their own, their neighbors, their colleagues, or their constituents. Apparently no eruption of adverse public opinion toward televised instruction was detected.

Several pages in the report are given over to the reactions of individual members of an observer panel of educators who visited Penn State at various times during the TV experimental program. It is even more difficult for a reviewer to summarize these reactions than to summarize the volume of reported quantitative data. However, it is quite safe to predict that every reader will find something in these observations to which he can say "Amen!"

Your reviewer was especially intrigued by the reactions of Dr. Gordon N. Ray, of the Department of English of the University of Illinois. Here are two samples, quoted out of context:

> But though I quickly saw that closed-circuit television is being tested under very favorable conditions at Pennsylvania State, I continue to believe that it can only be regarded as a *pis aller*, except when employed as an auxiliary in classes taught by traditional methods.
>
> * * *
>
> The most interesting result that may be anticipated from such experiments, it seems to me, is one which at first glance may seem peripheral, *a renewed interest on the part of the faculty in the art of teaching*. . . .

Your reviewer looked up *pis aller* and discovered that it corresponds roughly to the American idiom, "last resort." To comment further would be to spoil the delight that comes from reading the observers' reactions in their entirety. They are perceptive, revealing, and representative. All have the wonderful quality of "sounding off" so frequently expressed in conversation but too rarely in print.

The section of the report on studies of appropriateness deals with operating details, necessary details but not overly exciting details. An involved reviewer enjoys exploiting his right of selectivity. This right derives from the general requirement that a review be somewhat briefer than the work reviewed, and that it reflect the priority of tastes and values of the reviewer. Hence, the blatant disregard that this reviewer shows for the discussion of adaptability. Let it be noted that this section will be worthwhile reading for those actively engaged in or contemplating the use of TV in instruction. In the practicalities of action, operating details are both relevant and important.

On the subject of practicality of closed-circuit TV in college and university instruction, the section of the report on feasibility is highly useful and makes fascinating reading. Here are set down the honest facts and the hard lessons learned in the installation, adaptation, and actual use of a complex electronic system of communication. At Penn State, the electrical engineering curriculum provides a reservoir of students in various stages of personal interest and professional competence in television. In this report, the need for trained personnel is thoroughly described.

Your reviewer passes over the discussion of vidicon television systems, since he is less than expertly qualified in engineering, cost, and quality comparisons of TV systems. Such comparisons

easily get into the heated stage when contenders are opinionated but not technically sophisticated.

The use of standard TV receivers in the closed-circuit TV system at Penn State posed problems not exactly trivial. Video and audio signals differ. This difference must be reconciled somewhere along the line—this is a problem. Stringing coaxial cables through old classroom buildings is another problem. Tubes burning out, loose connections, and minor component failures are also problems that cause embarrassment.

Great ingenuity was used to overcome these problems within the conservative budget of the Penn State experiments. For the most part, the problems appear to have been satisfactorily overcome. The employment of a local engineering firm and of a full-time professional engineer provided a substantial basis for stabilizing the operation of the system.

One of the important advances at Penn State during the experimental period reported here was the facing-up to the technical problems of the TV system and to the requirement for technical personnel and facilities.

A cost analysis of courses taught with TV is included in the section on feasibility. Two summaries of data are especially interesting. On an average student-credit-unit cost comparison of conventional and TV instruction, the analysis shows a $9.48 net cost for conventional instruction and a $5.44 net cost for TV instruction. This analysis is based on composite data for four courses.

These data are unique to the TV system, the wage scale, and the administrative policies of Penn State. However, the reported net cost figures are impressive, especially in these days of mounting university expenses and expanding student populations.

The other interesting summation of relative costs of TV and conventional instruction, also based on composite of data on four courses, is presented in a graph of student credit costs in relation to the number of students enrolled in a TV course. The graph indicates that the point at which comparative costs are about equal is roughly 200 students. Projections indicate that conventional teaching is increasingly costly beyond this student population breakpoint.

This sort of analysis comes close to the heart of one of the theoretical values of TV in instruction—reduction of unit cost

when the number of students involved begins to rise beyond a few hundred.

The economics of education cannot be lightly dismissed. To be sure, there are other theoretical values of TV in education that are probably more important than its economics in the long haul. With the muddling of the nature and values of dollars, debt, education, and the national interest prevalent in political thinking today, the fact that it is hard to get more dollars for education is no state secret. Hence, the relationship of TV to the economics of education is of considerable import.

In closing, your reviewer is concerned that he has not included many more of the worthwhile developments and items of information with which this report is filled to the brim. The choice was between a glorified table of contents or the selection of a few high lights for somewhat extensive discussion. Messrs. Carpenter and Greenhill and collaborators must bear a small portion of the blame for the structure of this review, as well as credit for their pioneering contribution to the research literature on television in education. Their report is overloaded with information, and they persevere to the very end in their determination to leave summarization, inference, and evaluation to the reader. This would have been very fine indeed had the risk of hiding many bright and promising lights under a bushel been substantially less. To find these bright and promising lights you have no alternative but to add this report to your list of must reading.

RESEARCH ABSTRACTS

TELEVISION

MACLEAN, MALCOLM S., JR., and **CRANE, EDGAR.** *Content and Audience Response in ETV—Methods and Exploratory Runs.* A Progress Report to the Educational Television and Radio Center by the Communications Research Center, College of Communication Arts, Michigan State University, East Lansing, Michigan. October 1958. 159 p.

Purpose: To help producers of educational television programs determine what techniques best produce specified audience effects.

Procedure: Several methods for evaluating audience reactions were tried out. These were the program analyzer using a like-dislike scale, the Schwerin system, and the semantic differential. Two 30-minute kinescopes were presented over closed-circuit television to 148 selected viewers. The characteristics of the audience were analyzed. Test sessions lasted about three hours and included administration of a 20-item questionnaire, showing of the kinescope, and interviewing of the viewers. Answers to each question were analyzed. 69 semantic differential scales were used dealing with the performer, program, and the subject matter. Semantic differential profiles were prepared for the two films. Like-dislike profiles using the program analyzer were plotted for the two films. Group interview reactions were classified. A form was developed for analyzing the content of kinescopes. A plan was developed for evaluating other kinescopes of the Educational Television and Radio Center.

Results: Appendix A contains 38 pages of bibliography with abstracts on methods of sampling, audience types, and audience effects, methods of measuring audience reactions and variations within audio-visual materials. The audience was largely composed of housewives. 70 percent indicated they would watch a specified educational program as contrasted to a variety cavalcade. Using the semantic differential, useful programs were felt to be educational and controversial while useless programs were described as factual, neutral, educational, meaningful, simple, and easy to understand. Both kinescopes were rated as quite educational and informative and very slightly dull. Profiles of like and dislike ratings indicated that the kinescopes were monotonous with no extremely interesting parts. Group interviews indicated the program was too easy, repetitive, boring, and in certain parts presented too much to learn.—*L. Twyford*

JOINT COUNCIL ON EDUCATIONAL TELEVISION and the COMMITTEE ON TELEVISION OF THE AMERICAN COUNCIL ON EDUCATION. *Closed Circuit Television Installations in Educational Institutions.* 1785 Massachusetts Avenue, N.W., Washington 6, D. C. July 1958. 39 p.

Purpose: To compile information on the nature and uses of closed-circuit television facilities in educational institutions.

Procedure: A questionnaire was sent to accredited institutions of higher learning and to secondary and elementary schools known to have closed-circuit installations. Information was obtained on the origination points, type of equipment, reception points, subjects taught, grade level, number of students, reports available, and remarks.

Results: 133 closed-circuit systems used by 119 educational institutions were reported. Class instruction ranged from first grade through college postgraduate. A wide range of courses and subjects was covered. Reports were listed concerning television equipment installed, its application to course instruction, and evaluation of teaching by television. 21 military installations were listed that have used television.—*L. Twyford*

AUDIO

CUTLER, R. L.; McKEACHIE, W. J.; and McNEILL, E. B. "Teaching Psychology By Telephone." *American Psychologist* 13: 551-52; September 1958.

Purpose: To determine the practicability and effectiveness of presenting college level instruction by telephone.

Procedure: Two groups of 10 persons who volunteered for the experiment were matched for education, intelligence, and sex. Prior to the study the groups were given a content pretest, the Allport-Vernon Study of Values, the California "F" scale, an Attitudes Toward the Negro Questionnaire, and the Otis Self-Administering Test of Mental Abilities. An eight-week course in elementary psychology was designed and presented using a mixture of lecture-discussion, role playing, and demonstration methods. One group met face-to-face while the other group was taught by telephone. No text was used. An Executone speaker-microphone was installed in each home permitting intercommunication between telephone students.

Results: Both groups showed significant gains in knowledge and there was no significant difference in gain between the two classes. Both groups changed in the direction of more democratic attitudes but there was no difference between the groups. No significant changes occurred on the Allport-Vernon or the scale of attitude toward Negroes. All students were enthusiastic about the course. The authors were convinced that teaching by telephone is practical and more rewarding than television teaching.—*L. Twyford*

FILMS AND TELEVISION

FILM EVALUATION BOARD of ADVISORY BOARD ON EDUCATION and DIVISION OF MATHEMATICS. *The Use of Films and Television in Mathematics Education.* Publication 567. National Academy of Sciences—National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C. December 1957. 20 p. $1.

Purpose: To study the widespread and increasing interest in the preparation and use of films or televised lectures as applied to mathematics education. Also, to recommend a course of action appropriate for the Advisory Board on Education relating to such media.

Procedure: Six mathematicians accepted appointment to a Film Evaluation Board. They met for a three-day session at Pennsylvania State University and reviewed film research findings and television activities carried on there.

Results: The Board recommended the establishment of a standing committee to collect and classify mathematical presentations, to promote well-designed research, to promote participation of mathematicians, to assist in the development of realistic economic policies with reference to proprietary interests, and to study the economic impact of films and television on teaching and teachers. The Board recommended that quality presentations be employed. It recommended that an equitable dividend should accrue to all persons who participate in a presentation. Participation should be considered as an appropriate fraction of a teacher's academic duties. Not more than one-half of a scholar's time in a course of study should be taught exclusively by the media. Detailed considerations are given concerning instructor presentations and utilization of recordings of presentations.—*L. Twyford*

INSTRUCTIONAL MATERIALS

ALLEN, WILLIAM H. "Audio-Visual Communication Research." Prepared for the *Encyclopedia of Educational Research.* Third edition, to be published in January 1960. Report SP-36. System Development Corporation, 2500 Colorado Avenue, Santa Monica, California. September 20, 1958. 89 p.

Purpose: To prepare a comprehensive review of research to date on audio-visual aids such as motion pictures, filmstrips, television, radio, recording, graphic illustrations, school journeys, models, and demonstrations.

Procedure: Important research studies were selected and the principal findings were organized into appropriate categories.

Results: 343 research studies were listed as references and keyed into the text of the study. The introduction cited 77 studies. Under the heading of

effectiveness of audio-visual materials 6 general references were given, 17 on knowledge of facts, 18 on perceptional motor skills, 2 on concepts, 23 on motivation, interest, attitudes and opinions, 24 on filmstrips, 19 on pictorial illustration, 16 on graphic materials, 8 on field trips, 12 on three-dimensional materials, 11 on television, 39 on effectiveness of television teaching, 9 on use of kinescope recordings, 7 on student reactions to television teaching, 14 on radio and recordings. In the category of audience-learner characteristics 14 studies were cited on predisposition to acceptance, 7 on likes and interests, and 23 on intellectual ability, training, and prior knowledge. There were 17 on characteristics of the learning environment. 10 were described on teacher introductions and class preparation, 1 on student participation techniques, 6 on verbalization of response, 4 on perceptional motor responses, 10 on knowledge of results, 3 on mental practice, 2 on note-taking, 5 on class discussion, reviews, and summaries, 9 on repetitive use of films, 8 on miscellaneous techniques of use, and 27 on television presentation methods. Under the topics of administration of audio-visual programs 36 references are analyzed.—*L. Twyford*

WENDT, PAUL R. *Audio-Visual Instruction.* What Research Says to the Teacher, No. 14. Prepared by the American Educational Research Association in cooperation with the Department of Classroom Teachers, National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D. C. December 1957. 32 p. 25¢.

Purpose: To draw from research material on audio-visual instruction that information which might be of most help to classroom teachers and to present it in concise form.

Procedure: Research literature was reviewed and the opinion of experts was obtained concerning its proper interpretation. The manuscript was reviewed by several specialists and revised on the basis of their comments.

Results: The report describes the nature of audio-visual instruction, the nature of the communication process, dimension of meaning, and function of audio-visual materials. Information is given on a continuum of materials, danger of oversimplification, learning facts, retention of facts, interest, vocabulary development, opinions and attitudes, problem solving, and skills. Under the topic of factors affecting the value of audio-visual instruction information is given on utilization, teaching by television alone, integration of materials, improvement of audio-visual materials, and instructional film research. The capabilities of various audio-visual materials are given for the motion picture, four ways to present a still picture, use of kinesthetic materials, graphic materials, field trips, and teaching by television. Teacher preparation and the problem of putting research evidence into practice is discussed.—*L. Twyford*

The Library of Congress has cataloged this publication as follows:

Audio visual communication review. v. 1–
winter 1953–
[Washington]

v. in illus. 23 cm. quarterly.

Published by the Dept. of Audio-Visual Instruction, National Education Association of the United States.

1. Communication—Period. I. National Education Association of the United States. Dept. of Audio-Visual Instruction.

P90.A85 371.33305 56–4703

Library of Congress [5]

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